



U T T A R P R A D E S H



***Programme Handbook***

**Model Framework, Programme Structure, Graduate Attributes, Programme Educational Objectives, Programme Learning Outcomes, Employability, Assessment Plan And Scheme Of Instructions For Bachelors’ programmes**

**Faculty of amity institute of aerospace engineering**

**Domain:** Engineering & Technology

**Domain head :** Dr. K M Soni

**Domain Coordinator:** Dr Sanjay Singh

**Head of institution:** Dr Sanjay Singh

**Programme Group:** Four Years Bachelor Programme In

ENGINEERING& TECHNOLOGY

**2019-20**

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1. **Introduction: About Amity University**

Amity University Uttar Pradesh is a research and innovation driven University that seeks to develop graduates of international distinction by providing high quality education. Amity is at the forefront of cutting edge technology and scientific research. It has a strong R&D infrastructure and has numerous facilities and labs with modern state of the art equipments. Today, Amity is the hub of scientific learning, innovation and high-end research.

The University looks to serve as a vibrant platform for scientists, researchers and academicians drawn from world-renowned scientific and research organizations as well as academic institutions.

At Amity University Uttar Pradesh, academic excellence is the central focus of teaching and learning. The academic rigor and relevancy provide the students an advantage to grow into leaders in their chosen fields. Students can choose from more than 300 programmes in more than 50 disciplines. Conferences, Workshops and Seminars are conducted throughout the academic year, with active participation from the Industry and Academia.

The academic atmosphere of the University is encouraging, engaging, equitable and non-discriminatory. The Students, Faculty and Staff work as a community, as Amitian's, for the holistic development of each and every student. Students are encouraged to participate in various co-curricular and extra-curricular National and International Competitions as well as in Military Training Camps.

At Amity we benchmark only against the best institutions around the world. Our faculty and senior team travel all over the globe to learn and imbibe the best practices so that we can give a solid foundation for learning. As part of this endeavour, we have air-conditioned amphitheatre style classrooms that provide the most conducive atmosphere for dynamic and focused discussions, while the libraries at our campus are equipped with over 1,00,000 books, periodicals, national and international journals, CD-ROMS, covering all aspects of academic studies and research material. The hi-tech labs act as ideal training grounds for budding professionals that allow students to experiment and bring to practice what they have learnt in theory.

Amity's focus on path-breaking innovations in science & technology, a globally benchmarked infrastructure and record job offers have directly resulted in Amity Institutes emerging among the most sought after education destinations. Amity’s fast expanding network of globally benchmarked institutions has resulted in campuses across Noida, Greater Noida, Lucknow and Dubai. Amity’s focus on path-breaking innovations in science & technology, a globally benchmarked infrastructure and record job offers have directly resulted in Amity institutes emerging among the most sought after education destinations.

* 1. **University Vision, Mission and Core Values**

**Vision**

Building the nation and the society through providing total, integrated and trans-cultural quality education and to be the global front runner in value education and nurturing talent in which Modernity Blends with Tradition

**Mission**

To provide education at all levels in all disciplines of modern times and in the futuristic and emerging frontier areas of knowledge, learning and research and to develop the overall personality of students by making them not only excellent professionals but also good individuals, with understanding and regard for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action.

**Core Values**

##### **Academic Excellence**

University strives for the uncompromising quality and highest standard of excellence in teaching, learning, research and scholarship across various disciplines.

**Integrity & Ethics**

University upholds the highest ethical values, integrity and professionalism and an unwavering commitment to academic freedom, transparency and accountability.

**Diversity & Mutual Respect**

University nurtures an environment of safety, trust & mutual respect and embeds equality & diversity in its Strategy by ensuring that the strategic plans are fair and inclusive.

**Expand horizons of Knowledge**

University is driven by research and innovation and ensures continuous engagement in the scholarly activities in the pursuit of innovation, creativity and excellence

**Shared governance**

University encourages shared decision-making through a process that rests upon collaborative consultation, open flow of information, diverse involvement and collective deliberations of all stake holders

**Social responsibility**

University creates and nurtures an inclusive environment where every one can develop their full potential and contribute to the interest of the society as a whole.

**Environmental responsibility**

University is acutely aware of its environmental responsibilities and embraces principle of sustainable development to ensure that any adverse environmental impact of its activities is minimized.

**Service**

University seeks to serve the diverse, personal and professional development needs of its constituents and encourage habit of engagement, caring, and civic responsibility by emphasizing on a connect between service, excellence, and career growth.

* 1. **Broad Based Goals and Strategic Plan**

Broad based Goals and strategic plan describe the desired results of the various academic and operational activities and establish the foundation for assessment. These Goals are broad, clear, and a general statement of what the University intends to accomplish in terms of learning and operational effectiveness. It describes the general aims and aspirations of the University. Our broad based goals are

1. Educational Excellence
2. Holistic Development of Students
3. Innovation & Research Excellence
4. Intellectual Capital Enhancement
5. Maintain High Ethical Values and Foster Social & Environmental Responsibility
6. Internationalization
7. Attaining & Retaining Accreditations and Enhance Rankings
8. Building Strong Industry Linkages And Alumni Network
9. Enhance employability and entrepreneurial capabilities among students
10. Adopt Good Governance

Each broad-based goal has multiple strategic initiatives and evidences. Strategic initiatives and evidences are articulated for each goal in order to describes in precise and measurable terms the specific, observable, and desired results pertaining to student learning and the operational effectiveness

The broad based goals are consistent with the mission of the University. The University’s broad-based goals are blueprint for implementing the mission, setting targets and developing measurable outcomes.

The Broad based goals at Amity University are articulated from the University’s Objectives. These Objectives flow from the Mission and vision of the University and are associated with, contribute to and mapped to some aspect of the University’s mission

1. **University Graduate Attributes**

Amity University students gain an impressive range of knowledge and skills whilst at University.  To make these clear to our students and to the future employers of students, **'The Amity Graduate' attributes**’ have been identified as a part of our commitment towards supporting student’s development.

Graduate Attributes are central to the design, delivery and assessment of student learning in all faculties of Studies at the University. These University Graduate attributes are as follows:

|  |  |
| --- | --- |
| **#** | **Graduate Attribute** |
|  | Knowledge & Expertise of a Discipline |
|  | Research and Enquiry |
|  | Information & Digital Literacy |
|  | Problem Solving |
|  | Communication |
|  | Behavioral Skills, Teamwork and Leadership |
|  | Global Citizen |
|  | Ethical, Social and Professional Understanding |
|  | Employability, Enterprise & Entrepreneurship |
|  | Lifelong Learning |

The Graduate attributes flow from University level to domain level, from domain level to institution level, from institution to programme level. For each programme ion the management domain, graduate attributes are defined and the programme aims to inculcate these attributes in the students during their course of study.

* 1. **Introduction to Domain/ Faculty of Engineering & Technology**

The **Faculty of Engineering & Technology** ensures to provide ample opportunities to its students’ to excel in their careers and strives to fulfill its mission

**“Mission:** To provide education at all levels in all disciplines of Engineering and Technology and in the futuristic and emerging frontier areas of knowledge, learning and research and to develop the overall personality of students by making them not only excellent Engineering professionals and technocrats but also good individuals, with understanding and regards for human values, pride in their heritage and culture, a sense of right and wrong and yearning for perfection and imbibe attributes of courage of conviction and action.**”.**

**About the Faculty:**

The **Domain of Engineering & Technology (DET)** has been established with an objective to educate, equip and empower the aspiring business leaders with relevant managerial skills, fostering values, creating social responsibility and global competence to meet the requirements of the changing and challenging business world.

**2.2 Academic System**

At Amity University Uttar Pradesh, academic excellence is the central focus of teaching and learning. The academic rigor and relevancy provide the students an advantage to grow into leaders in their chosen fields. Students can choose from more than 300 programmes in more than 50 disciplines. Conferences, Workshops and Seminars are conducted throughout the academic year, with active participation from the Industry and Academia.

The academic atmosphere of the University is encouraging, engaging, equitable and non-discriminatory. The Students, Faculty and Staff work as a community, as Amitian's, for the holistic development of each and every student. Students are encouraged to participate in various co-curricular and extra-curricular National and International Competitions as well as in Military Training Camps.

Amity University, as per Guidelines of UGC and related regulatory bodies follows semester /year based system of study. Degree nomenclature and credits for all the programmes are consistent with levels of quality and rigor appropriate to higher education ensuring compliance with the norms and standards of all the relevant statutory and regulatory bodies. Evaluation of the students is done through appropriate mode of continuous evaluation during the semester and through end semester examinations.

**Annual Academic Calendar & Semester System**

Amity University follows semester system for conduct of classes. Annual Academic calendar have odd Semesters (I, III, V, VII etc) and even semesters (II, IV, VI, VIII etc.). Each semester consists of 15-18 weeks excluding examination period and semester break period. Odd Semesters normally commence in the month of July/August and end in October/November and Even Semesters commence in December and end in April/May on specified dates mentioned in Annual Academic Calendar. The Summer Break normally covers practical training, field based / industry centric courses called **Non- Teaching Credit Courses** (NTCC). Duration of summer break is variable in length for different programmes

Date of Commencement of each semester and last teaching day of semester is finalized well in advance in the detailed ‘Annual Academic Calendar’ for a programme in accordance with ‘Block Academic Calendar’ of the University

**2.3 Choice Based Credit System & Flexi Timings**

To maintain uniformity in all the programmes and at the same time offer more choice of courses to students, **Model Framework** for Programme Structure for all UG and PG programme / degree has been defined which includes semester-wise credit distribution for various course types. The courses and credits offered by the institutions in the programme structure are as per the model framework.

Amity University offers the **Choice Based Credit System** (CBCS) in its academic curriculum, in its endeavor to provide quality education. Under this system, the students can register for courses according to their interests, academic abilities and career aspirations. Students decide their academic plan and alter it, if required, in their academic progression in pursuit of degree.

A **Master** **Academic Planning Worksheet (APW)** is available on AMIZONE for students as per the Programme Structure and Model Framework for their respective programme. Student is expected to earn the minimum number of credits for a course type/ semester as prescribed in the model framework of their programme.

A student is required to choose the courses from the offerings and make their own Academic Planning worksheet. However, a student can choose 15% extra credits from the Specialisation Electives, Open Electives, Domain Electives, Outdoor Activity Based Courses (OABC) and FBL Electives in addition to the minimum prescribed credit units to choose interdisciplinary courses from other institutions/domains.

Apart from core, allied and Non Teaching Credit Courses which are compulsory in nature, ample options are available in the Master Academic Planning Worksheet for a semester, which help the students to make their own basket of courses to develop additional skills in there area of interest.

Students are also allowed to add or drop registered courses to balance workload to optimize or maximize grade points, course substitution option, grade improvement, credit transfer for course migration as per the University Policy on Credit System, Academic Credit Hour and Time Tabling.

**Flexi Timings**

Flexi Time tabling help students to choose the courses they want to study and when to study from the slot-based timetable, coupled with on-line Course Registration, through Amizone, in each semester.

The Institutions/departments prepare, review and publish the weekly class time-table on AMIZONE prior to the start of each semester to ensure that all classes are scheduled for the minimum number of session(s) of 50 minutes each. The Students select and register for the course time slot. Students make their own time-table and each student in a class may have a different timetable of his / her own.

1. **Approach to Curriculum Review & Development**

As a major objective of degree programmes in Engineering & Technology domain is to lay special emphasis on educating/preparing the students wellfor being able to demonstrate the following abilities:

1. Effective application of engineering concepts in the corporate world;
2. Working in teams;
3. Developing decision making skill
4. Effective communication skills and leadership/participation in team work;
5. Fulfillment of professional, social and ethical responsibilities;
6. Sensitivity to environmental issues and concerns;

(j) Planning, development and implementation of strategies for life-long learning.

These requirements call for the following objectives to the Approach to Curriculum relating to programmes in Enginering & Technology Degree in the country:

1. ***Preparation****:* To prepare the students to excel in various educational programmes or to succeed in industry / technical profession through further education/training;
2. ***Core Competence****:* To provide the students with a solid foundation in Engineering & Technology concepts;
3. ***Breadth****:* To train the students with a breadth of Engineering & Technology knowledge to comprehend, analyze and deal with real life situations;
4. ***Professionalism****:* To inculcate in the students professional/ethical attitude, effective team work skills, multidisciplinary approach and to relate Engineering & Technology issues to a broader context;
5. ***Learning Environment:*** To provide the students with academic environment ofexcellence, leadership, ethical guidelines and life-long learning needed for a long/productive career.

The programme structure for each programme is developed carefully ensuring that the content and curriculum is current and appropriate to the programmes objectives and learning outcomes.

**Content, Curriculum and Scheme of Examinations**

Content, Curriculum and scheme of examinations are the most important components of academic excellence and their development and approval is a detailed exercise which involves screening at various levels.

Heads of Institutions/Departments constitute **Course Review Committee (CRC)**, **Area Advisory Board (AAB) and Programme Review Committee (PRC)** to develop/ review the curriculum and programme structure respectively.

**The Course Review Committee (CRC)** defines the course Objectives, course contents, and Students Learning Outcomes and assessment tools/components for each course. The recommendations of the CRC are put up to specific Area Advisory Board

**Area Advisory Board is** constituted to ensure that the course and syllabus are as per the needs of profession / industry at a specific level (UG/PG) and to benchmark as per the National/International curriculum.

**The** **Programme Review Committee (PRC)** defines the Programme Educational Objectives (PEOs), Programme Operational Goals, Programme Learning Outcome (PLO), Programme Structure (PS) and the Assessment plan for evaluating operational and educational outcomes, based on inputs from various stakeholders.

**Recommendations of AAB and PRC are put up to the “Board of Studies” (BoS)**

Board of Studies (BoS) reviews and recommends appropriate Programme structure, curricula & syllabi designed and developed by PRC and AAB.

The recommendations of BoS along with the final Programme structure (Programme Educational Objectives (PEOs), Programme Learning Outcomes (PLOs), and Outcome assessment plan), Course curriculum, and scheme of examinations for each course are further put up for the final approval of Academic Council.

After the approval of Academic council, the Programme Structure, Course curriculum, scheme of examinations and other relevant information is uploaded on Amizone for student access

* 1. **Institutions / Programmes**

1. Faculty of Engineering & Technology has following institutions/Programme in various campuses of the University:

|  |  |  |
| --- | --- | --- |
| **#** | | **Institution** |
| **Campus – Noida** | | |
| 1 | **Amity Institute of Aerospace Engineering (AIAE)** | |
| 2 | **Amity Institute of Space Science and Technology (AISST)** | |
| 3 | **Amity Institute of Technology (AIT)** | |
| 4 | **Amity Institute of Nuclear Science and Technology (AINST)** | |
| 5 | **Amity Institute of Renewable and Alternative Energy (AIRAE)** | |
| 6 | **Amity Institute of Information and Technology (AIIT)** | |
| 7. | **Amity School of Engineering (ASE)** | |
| 8. | **Amity School of Engineering and Technology (ASET)** | |
| **Lucknow** | | |
| 1 | | **Amity School of Engineering and Technology (ASET)** |
| **Greater Noida** | | |
| 1 | |  |
| **Dubai** | | |
| 1 | | **Amity School of Engineering and Technology (ASET)** |

1. **Programmes Offered**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.No** | **Programme Groups/ Programmes** | **Noida** | **Greater**  **Noida** | **Lucknow** | **AUD** |
| 1 | Bachelors’ Programmes |  |  |  |  |
| 1.1 | Bachelors of Technology  (Aerospace Engineering) | AIAE | - | ASET | ASET |
|  |  |  |  |  |  |

* 1. **Domain Graduate Attributes**

**Domain Graduate attributes –** The graduate attributes are defined at the domain level and the programme level aligned with the University Graduate Attributes. The domain graduate attributes for the **Faculty of Engineering and Technology** are given as under:

1. Engineering Knowledge
2. Investigation
3. Modern Tool Usage
4. Design/ Development of Solution
5. Communication
6. Individual and Team Work
7. The Engineer and Society
8. Ethics
9. Project Management and Finance
10. Lifelong learning
11. Environment and Sustainability
12. Program Analysis

## Domain Educational and Operational goals

## The broad based goal of the domain is aligned with the University Goals and Objectives. The Broad based goals are broadly defined as Domain Educational Objectives and Operational Objectives as under:

* 1. **Educational Objectives:**

|  |  |
| --- | --- |
|  | Students will acquire and demonstrate knowledge of theory and concepts of Engineering & Technology and application of these concepts in a professional work setting |
|  | Students will be able to comprehend, analyse, formulate, design & develop novel products and solutions for real life problems |
|  | Students will be able to develop the understanding of global environment and relate Engineering issues to the broader social, legal, cultural and environmental contexts |
|  | Students will develop and sustain effective performance by leveraging Information and Technological competencies in the professional/entrepreneurial careers |
|  | Students will demonstrate professional attitudes, effective communication and behavioral skills that support and enhance individual’s performance |
|  | Students will develop technical competence for successful and productive careers or advance studies/research in the field of Engineering & Technology |
|  | Students will develop professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams and in managing projects. |
|  | Students will critically evaluate and reflect learning and development throughout their career |

* 1. **Operational Objectives: Faculty of Engineering and Technology will**

|  |  |
| --- | --- |
| 1 | **Create** appropriate teaching learning resources, infrastructure and conducive environment for excellence in teaching, learning, research and professional development of students. |
| 2 | **Provide** Professional development programmes/opportunities to the faculty and staff   to regularly upgrade their  knowledge and skills and bring excellence in teaching, learning and research. |
| 3 | **Demonstrate** sensitivity to the diverse needs of students and accordingly develop facilities and services. |
| 4 | Continuously strive **to build** strong industry interaction, alumni networks and empanelment of expertise from industry. |
| 5 | Continually **improve**the quality of facilities, services, resources and processes with an aim to attain **national** and international accreditations and institutional ranking. |
| 6 | **Arrange all necessary**support system for the students to facilitate campus recruitment, higher education or starting their own ventures |
| 7 | **Act** ethically to ensure transparency and good governance **while discharging** various  responsibilities to its  stakeholders and execution of policies and programs |
| 8 | **Create**opportunities forinternational exposure for its students and faculty. |

1. **Programme Group-Wise Model Framework:**

All the programmes offered at Amity University are grouped. Programme in each group share the similar model framework. The model framework for each group describes the course wise credit distribution which is followed by each institution while making the programme structure of all the programmes offered by them.

The Model framework of Programme Group of the respective Bachelor’s programme of the domain for designing the programme structure is given as under:

**Model Framework for Four Years Full-Time Bachelors Programme in Engineering & Technology**

(B.Tech - Semester-Wise Course ‘Credit distribution, batch 2016-20)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **Courses** | **Sem 1 (CU)** | **Sem 2 (CU)** | **Summer Break (CU)** | **Sem 3 (CU)** | **Sem 4 (CU)** | **Summer Break (CU)** | **Sem 5 (CU)** | **Sem 6 (CU)** |  | **Summer Break (CU)** | **Sem 7 (CU)** | **Sem 8 (CU)** |
| 1 | Human Social Sciences & Management Courses | Min :3 Max :3 | Min :3 Max :3 | 1 | Min :0 Max :0 | Min :0 Max :0 | 2 | Min :0 Max :0 | Min :0 Max :0 |  | 3 | Min :0 Max :0 | Min :0 Max :0 |
| 2 | Basic Sciences Courses | Min :14 Max :14 | Min :11 Max :14 |  | Min :3 Max :4 | Min :4 Max :4 |  | Min :0 Max :0 | Min :0 Max :0 |  |  | Min :0 Max :0 | Min :0 Max :0 |
| 3 | Engineering Sciences Courses | Min :5 Max :5 | Min :5 Max :8 |  | Min :10 Max :11 | Min :1 Max :1 |  | Min :0 Max :2 | Min :0 Max :2 |  |  | Min :0 Max :0 | Min :0 Max :0 |
| 4 | Core Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :8 Max :11 | Min :16 Max :17 |  | Min :11 Max :17 | Min :16 Max :19 |  |  | Min :0 Max :3 | Min :0 Max :0 |
| 5 | Specialisation Elective Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :7 | Min :3 Max :6 |  |  | Min :15 Max :18 | Min :0 Max :6 |
| 6 | Domain Elective Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :4 | Min :0 Max :4 |  |  | Min :0 Max :6 | Min :0 Max :0 |
| 7 | Open Elective Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :2 | Min :0 Max :2 |  | Min :0 Max :3 | Min :0 Max :3 |  |  | Min :0 Max :3 | Min :0 Max :0 |
| 8 | Non Teaching Credit Courses | Min :0 Max :2 | Min :0 Max :2 |  | Min :0 Max :2 | Min :0 Max :2 |  | Min :2 Max :2 | Min :0 Max :0 |  |  | Min :2 Max :2 | Min :10 Max :10 |
| 9 | Mandatory Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :1 Max :1 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  |  | Min :4 Max :4 | Min :0 Max :0 |
| 10 | Value Addition Courses **➨**Behavioural Science | Min :1 Max :1 | Min :1 Max :1 |  | Min :1 Max :1 | Min :1 Max :1 |  | Min :4 Max :4 | Min :0 Max :0 |  |  | Min :0 Max :0 | Min :0 Max :0 |
|  | Value Addition Courses **➨**Communication Skills | Min :1 Max :1 | Min :1 Max :1 |  | Min :1 Max :1 | Min :1 Max :1 |  | Min :0 Max :0 | Min :4 Max :4 |  |  | Min :0 Max :0 | Min :0 Max :0 |
|  | Value Addition Courses **➨**Foreign Business Language | Min :2 Max :2 | Min :2 Max :2 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :2 Max :2 | Min :2 Max :2 |  |  | Min :0 Max :0 | Min :0 Max :0 |
| 11 | Outdoor Activity Based Courses | Min :0 Max :1 | Min :0 Max :1 |  | Min :0 Max :1 | Min :0 Max :1 |  | Min :0 Max :1 | Min :0 Max :1 |  |  | Min :0 Max :1 | Min :0 Max :0 |
| 12 | SAP Courses (Optional) | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :13 | Min :0 Max :13 |  | Min :0 Max :14 | Min :0 Max :13 |  |  | Min :0 Max :10 | Min :0 Max :6 |
| 13 | Employability & Skill Enhancement Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :2 Max :2 | Min :2 Max :2 |  |  | Min :0 Max :4 | Min :0 Max :0 |
| 14 | Industry Specific Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :6 | Min :0 Max :6 |  |  | Min :0 Max :9 | Min :0 Max :0 |
| 15 | MOOC (Amity On - line / NPTEL / SWAYAM / Future Learn) | Min : Max : | Min : Max : |  | Min : Max : | Min : Max : |  | Min :0 Max :4 | Min :0 Max :4 |  |  | Min :0 Max :4 | Min :0 Max :6 |
|  | **Total** | **26** | **26** | **1** | **27** | **26** | **2** | **28** | **30** |  | **3** | **20** | **16** |

**Minimum Credits Prescribed For Programmes :**199

(B.Tech - Semester-Wise Course ‘Credit distribution, batch 2017-21)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **Courses** | **Sem 1 (CU)** | **Sem 2 (CU)** | **Summer Break (CU)** | **Sem 3 (CU)** | **Sem 4 (CU)** | **Summer Break (CU)** | **Sem 5 (CU)** | **Sem 6 (CU)** | **Summer Break (CU)** | **Sem 7 (CU)** | **Sem 8 (CU)** |
| 1 | Human Social Sciences & Management Courses | Min :3 Max :3 | Min :3 Max :3 | 1 | Min :0 Max :0 | Min :0 Max :0 | 2 | Min :0 Max :0 | Min :0 Max :0 | 2 | Min :0 Max :0 | Min :0 Max :0 |
| 2 | Basic Sciences Courses | Min :9 Max :12 | Min :9 Max :12 |  | Min :4 Max :4 | Min :4 Max :4 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
| 3 | Engineering Sciences Courses | Min :5 Max :8 | Min :5 Max :8 |  | Min :8 Max :10 | Min :1 Max :3 |  | Min :0 Max :2 | Min :0 Max :2 |  | Min :0 Max :0 | Min :0 Max :0 |
| 4 | Core Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :8 Max :10 | Min :15 Max :17 |  | Min :11 Max :17 | Min :16 Max :19 |  | Min :0 Max :3 | Min :0 Max :0 |
| 5 | Specialisation Elective Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :6 | Min :3 Max :6 |  | Min :13 Max :16 | Min :0 Max :6 |
| 6 | Domain Elective Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :6 | Min :0 Max :0 |
| 7 | Open Elective Courses | Min :0 Max :0 | Min :0 Max :1 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :3 | Min :0 Max :3 |  | Min :0 Max :3 | Min :0 Max :0 |
| 8 | Non Teaching Credit Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :1 Max :1 | Min :0 Max :0 |  | Min :2 Max :2 | Min :0 Max :0 |  | Min :2 Max :2 | Min :10 Max :10 |
| 9 | Mandatory Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :4 Max :4 | Min :0 Max :0 |
| 10 | Value Addition Courses **➨**Behavioural Science | Min :1 Max :1 | Min :1 Max :1 |  | Min :0 Max :0 | Min :3 Max :3 |  | Min :3 Max :3 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
|  | Value Addition Courses **➨**Communication Skills | Min :1 Max :1 | Min :1 Max :1 |  | Min :3 Max :3 | Min :0 Max :0 |  | Min :0 Max :0 | Min :3 Max :3 |  | Min :0 Max :0 | Min :0 Max :0 |
|  | Value Addition Courses **➨**Foreign Business Language | Min :2 Max :2 | Min :2 Max :2 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :0 Max :0 | Min :0 Max :0 |
| 11 | Outdoor Activity Based Courses | Min :0 Max :1 | Min :0 Max :1 |  | Min :0 Max :1 | Min :0 Max :1 |  | Min :0 Max :1 | Min :0 Max :1 |  | Min :0 Max :2 | Min :0 Max :2 |
| 12 | SAP Courses (Optional) | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :12 | Min :0 Max :13 |  | Min :0 Max :14 | Min :0 Max :13 |  | Min :0 Max :10 | Min :0 Max :6 |
| 13 | Employability & Skill Enhancement Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :0 Max :4 | Min :0 Max :0 |
| 14 | Industry Specific Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :6 |  | Min :0 Max :6 | Min :0 Max :6 |  | Min :0 Max :9 | Min :0 Max :0 |
| 15 | MOOC (Amity On - line / NPTEL / SWAYAM / Future Learn) | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :4 | Min :0 Max :6 |
|  | Value Addition Courses **➨**Professional Ethics | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :2 Max :2 | Min :0 Max :0 |
|  | **Total** | **24** | **24** | **1** | **28** | **27** | **2** | **27** | **29** | **2** | **20** | **16** |

**Minimum Credits Prescribed For Programmes :**197

**Remarks :**Minimum Credit Units (CUs) prescribed for programmes (197) = Sum of credit units of all semester (195 CUs) + 02 flouting CUs for “Outdoor Activity Based Courses (OABC)” to be compulsory opted by students during the programme for completion of degree.

(B.Tech - Semester-Wise Course ‘Credit distribution, batch 2018-22)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **Courses** | **Sem 1 (CU)** | **Sem 2 (CU)** | **Summer Break (CU)** | **Sem 3 (CU)** | **Sem 4 (CU)** | **Summer Break (CU)** | **Sem 5 (CU)** | **Sem 6 (CU)** | **Summer Break (CU)** | **Sem 7 (CU)** | **Sem 8 (CU)** |
| 1 | Human Social Sciences & Management Courses | Min :3 Max :3 | Min :3 Max :3 | 1 | Min :0 Max :0 | Min :0 Max :0 | 2 | Min :0 Max :0 | Min :0 Max :0 | 2 | Min :0 Max :0 | Min :0 Max :0 |
| 2 | Basic Sciences Courses | Min :9 Max :12 | Min :9 Max :12 |  | Min :4 Max :4 | Min :4 Max :4 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
| 3 | Engineering Sciences Courses | Min :5 Max :8 | Min :5 Max :8 |  | Min :8 Max :10 | Min :1 Max :3 |  | Min :0 Max :2 | Min :0 Max :2 |  | Min :0 Max :0 | Min :0 Max :0 |
| 4 | Core Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :8 Max :10 | Min :15 Max :17 |  | Min :11 Max :17 | Min :16 Max :19 |  | Min :0 Max :3 | Min :0 Max :0 |
| 5 | Specialisation Elective Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :7 | Min :3 Max :6 |  | Min :13 Max :16 | Min :0 Max :6 |
| 6 | Specialisation Electives for Minor Degree | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
| 7 | Specialisation Electives for Hons. | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
| 8 | Domain Elective Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :6 | Min :0 Max :0 |
| 9 | Open Elective Courses | Min :0 Max :0 | Min :0 Max :1 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :3 | Min :0 Max :3 |  | Min :0 Max :3 | Min :0 Max :0 |
| 10 | Non Teaching Credit Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :1 Max :1 | Min :0 Max :0 |  | Min :2 Max :2 | Min :0 Max :0 |  | Min :2 Max :2 | Min :10 Max :10 |
| 11 | Mandatory Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :4 Max :4 | Min :0 Max :0 |
| 12 | Value Addition Courses **➨**Behavioural Science | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :4 Max :4 |  | Min :4 Max :4 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
|  | Value Addition Courses **➨**Communication Skills | Min :4 Max :4 | Min :4 Max :4 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
|  | Value Addition Courses **➨**Foreign Business Language | Min :2 Max :2 | Min :2 Max :2 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :0 Max :0 | Min :0 Max :0 |
| 13 | Outdoor Activity Based Courses | Min :0 Max :1 | Min :0 Max :1 |  | Min :0 Max :1 | Min :0 Max :1 |  | Min :0 Max :2 | Min :0 Max :2 |  | Min :0 Max :2 | Min :0 Max :2 |
| 14 | SAP Courses (Optional) | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :12 | Min :0 Max :14 |  | Min :0 Max :14 | Min :0 Max :13 |  | Min :0 Max :10 | Min :0 Max :6 |
| 15 | Employability & Skill Enhancement Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :0 Max :4 | Min :0 Max :0 |
| 16 | Industry Specific Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :6 |  | Min :0 Max :6 | Min :0 Max :6 |  | Min :0 Max :9 | Min :0 Max :0 |
| 17 | MOOC (Amity On - line / NPTEL / SWAYAM / Future Learn) | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :8 | Min :0 Max :6 |
|  | Value Addition Courses **➨**Professional Ethics | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :2 Max :2 | Min :0 Max :0 |
|  | **Total** | **26** | **26** | **1** | **25** | **28** | **2** | **28** | **26** | **2** | **20** | **16** |

**Minimum Credits Prescribed For Programmes :**197

**Remarks :**Minimum Credit Units (CUs) prescribed for programmes (197) = Sum of credit units of all semester (195 CUs) + 02 flouting CUs for “Outdoor Activity Based Courses (OABC)” to be compulsory opted by students during the programme for completion of degree.

(B.Tech - Semester-Wise Course ‘Credit distribution, batch 2019-23)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **Courses** | **Sem 1 (CU)** | **Sem 2 (CU)** | **Summer Break (CU)** | **Sem 3 (CU)** | **Sem 4 (CU)** | **Summer Break (CU)** | **Sem 5 (CU)** | **Sem 6 (CU)** | **Summer Break (CU)** | **Sem 7 (CU)** | **Sem 8 (CU)** |
| 1 | Human Social Sciences & Management Courses | Min :0 Max :4 | Min :0 Max :0 | 1 | Min :0 Max :0 | Min :4 Max :4 | 2 | Min :0 Max :0 | Min :0 Max :0 | 2 | Min :6 Max :6 | Min :0 Max :0 |
| 2 | Basic Sciences Courses | Min :9 Max :12 | Min :9 Max :12 |  | Min :4 Max :4 | Min :4 Max :4 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
| 3 | Engineering Sciences Courses | Min :5 Max :8 | Min :5 Max :8 |  | Min :8 Max :10 | Min :1 Max :3 |  | Min :0 Max :2 | Min :0 Max :2 |  | Min :0 Max :0 | Min :0 Max :0 |
| 4 | Core Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :8 Max :10 | Min :13 Max :15 |  | Min :11 Max :15 | Min :12 Max :15 |  | Min :0 Max :3 | Min :0 Max :0 |
| 5 | Specialisation Electives for Minor Degree | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :4 | Min :0 Max :10 |
| 6 | Specialisation Elective Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :7 | Min :3 Max :7 |  | Min :10 Max :15 | Min :0 Max :0 |
| 7 | Specialisation Electives for Hons. | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :4 | Min :0 Max :10 |
| 8 | Domain Elective Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :6 | Min :0 Max :0 |
| 9 | Open Elective Courses | Min :0 Max :0 | Min :0 Max :1 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :3 | Min :0 Max :3 |  | Min :0 Max :3 | Min :0 Max :0 |
| 10 | Non Teaching Credit Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :1 Max :1 | Min :0 Max :0 |  | Min :2 Max :2 | Min :0 Max :0 |  | Min :2 Max :2 | Min :10 Max :10 |
| 11 | Mandatory Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :4 Max :4 | Min :0 Max :0 |
| 12 | Value Addition Courses **➨**Behavioural Science | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :4 Max :4 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
|  | Value Addition Courses **➨**Communication Skills | Min :4 Max :4 | Min :4 Max :4 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |
|  | Value Addition Courses **➨**Foreign Business Language | Min :2 Max :2 | Min :2 Max :2 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :2 Max :2 | Min :0 Max :0 |
| 13 | Outdoor Activity Based Courses | Min :0 Max :1 | Min :0 Max :1 |  | Min :0 Max :2 | Min :0 Max :2 |  | Min :0 Max :2 | Min :0 Max :2 |  | Min :0 Max :2 | Min :0 Max :0 |
| 14 | SAP Courses (Optional) | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :12 | Min :0 Max :13 |  | Min :0 Max :13 | Min :0 Max :12 |  | Min :0 Max :13 | Min :0 Max :0 |
| 15 | Employability & Skill Enhancement Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :2 Max :2 | Min :2 Max :2 |  | Min :0 Max :4 | Min :0 Max :0 |
| 16 | Industry Specific Courses | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :7 |  | Min :0 Max :7 | Min :0 Max :7 |  | Min :0 Max :9 | Min :0 Max :0 |
| 17 | MOOC (Amity On - line / NPTEL / SWAYAM / Future Learn) | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :4 | Min :0 Max :4 |  | Min :0 Max :9 | Min :0 Max :9 |  | Min :0 Max :10 | Min :0 Max :6 |
|  | Value Addition Courses **➨**Professional Ethics | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :0 Max :0 |  | Min :0 Max :0 | Min :2 Max :2 |  | Min :0 Max :0 | Min :0 Max :0 |
|  | **Total** | **23** | **23** | **1** | **25** | **26** | **2** | **26** | **26** | **2** | **26** | **10** |

**Minimum Credits Prescribed For Programmes :**187

**Remarks :**Minimum Credit Units (CUs) prescribed for programmes (187) = Sum of credit units of all semester (185 CUs) + 02 flouting CUs for “Outdoor Activity Based Courses (OABC)” to be compulsory opted by students during the programme for completion of degree.

* 1. **Detailed Programme Structure:**

The detailed programme structure with courses under various categories and types as per prescribed Credit Units are developed. The programme structure includes the courses which are compulsory in nature and specilalisation electives are given with course title and credit units semester-wise as approved by Academic Council. Compulsory Courses includes Core Courses, Allied courses, Value Addition Courses, Mandatory Courses, NTCC courses. Further, Course Titles and Credit Units of the Specialisation Electives and NTCC elective courses are given. However, courses which are not compulsory to take in order to get a degree. These course may be taken by the students to meet the minimum requirement of Credit units for semester/programme for the award of the degree. These Electives Courses include Domain Electives (DE), Open Electives (OE), Outdoor Activities Based Courses (OABC), Skill Enhancement Courses (SKE), Study Abroad Programmes (SAP) Courses etc. These courses are offered by institutions of other domains or other institutions / campuses of the university and vary batch to batch. The detailed programme structure of all the programmes of the group(s) of the **Engineering and Technology** domain are given in Appendix.

1. **Programme Educational Objectives (PEOs)**

Programme Educational Objectives (PEOs) lay the foundation for what students are expected to do, know or value as a result of the educational experience. Objectives are the critical link between gaps and outcomes. Objectives guide the choice of content, the educational format, pedagogy and methodologies, and the methods for assessment.

The various levels that an objective is written, beginning with the lowest level and advancing to the highest are as follows:

* Knowledge
* Comprehension
* Application
* Analysis
* Synthesis
* Evaluation

**The Bachelor’s programme majorly focuses on the basic level of learning from Knowledge, Comprehension, application and analysis**

The Programme Educational Objectives (PEOs) are well defined and given in the programme structure of each programme, attached as **Appendix**

1. **Intended Programme Learning Outcomes (PLO)**

Intended Programme learning outcomes are statements that describe the desired learning that students should have acquired and should be able to demonstrate at the end of their course of study. Through these statements, programmes identify what students should know and be able to do as a result of completing their degree programs.

Consequently, statements of intended learning outcomes clearly articulates the intended knowledge, skills, abilities, competencies, attitudes, and values that characterize the essential learning required of a graduate of a particular programme of study.

Each Learning outcome is measurable and includes appropriate action verb relating to the desired action or performance associated with the intended cognitive level. The programme learning outcome (PLOs) are well defined and given in the programme structure of each programme, attached as **Appendix**

1. **Course Delivery & Pedagogy**

**Course Delivery** may use a combination of the following formats:  Lectures, classroom discussions, case studies, internship, term papers, role plays and dissertations.

Students are provided with curriculum and session plan of all the courses that they have chosen in their Academic Planning Worksheet. A Master Session Plan covers the following:

* Objectives of the course
* Session-wise details of topics
* Plan type (L-T-P )and reference material for each topic in the module
* Pedagogy to be adopted
* Prerequisites, if any
* Required readings, additional readings and assignments
  + Student learning Outcomes for each module
  + Assessment component used to assess the SLO’s for each module
* Scheme of evaluation and weightage of each assessment component

**Pedagogy**

The approach to pedagogy combines fieldwork, case studies and instrumented feedback with a strong emphasis on concepts and theory. A continuous quality interface with industry through internships, industrial visits, participation in business competitions, group discussions, workshops, seminars, etc. is encouraged

To stimulate, motivate and foster learning culture, diversified modes of content delivery are adopted by the faculty, in order to help students in achieving learning goals and to attain desired learning outcomes.

The objectives of focusing on the implementation of innovative teaching methodologies in traditional classrooms are:

* To make an effective combination of classroom activities and other instructional strategies ensuring that the students achieve the learning goals set by the teacher.
* To develop flexibility in content delivery
* To foster learning through several modes of information processing.
* To develop student’s understanding of application and implementation of classroom learning
* To cater for the range of learning needs of students
* To enhance students skills and competencies
* To promote students participation and engagement
* To shift focus from ‘surface learning to ‘deep learning’
* To emphasize on more student centric interactive teaching methods
* To improve teaching to match students needs and learning style
* To involve students in higher level of thinking
* To provide students an opportunity to bridge gap between academic theory and real world practices

Some of the Teaching Learning approaches adopted by the faculty are as follows:

|  |  |  |
| --- | --- | --- |
| # | Approaches | Description |
| 1 | Blended Learning | A mixed-mode of instruction strategy that creates an integrated approach for both teachers and students by the convergence of face-to-face classroom methods and [computer-mediated activities](http://en.wikipedia.org/wiki/E-learning) |
| 2 | Case Based Learning | A teaching approach that refers to the analytical thinking and reflective judgment of learners by reading and discussing complex, real-life scenarios |
| 3 | Cooperative Learning | Students work in groups to complete tasks collectively toward academic goals |
| 4 | Field Based Learning | In field-based learning, students, guided by faculty, take up a professional role and work directly with organizations to solve real problems and offer feasible solutions |
| 5 | Inquiry/ Research Based Learning | Students make observations, collect, analyze, and synthesize information, and draw conclusions to develop problem-solving skills which can be applied to situations that students will encounter in future |
| 6 | Lab Based Learning | Integrates theory with practice and blending other active learning strategies such as web or computer based learning |
| 7 | Problem Based learning | Students collaboratively work toward the resolution of complex and challenging problem |
| 8 | Community Service Learning | A technique of experiential learning that fosters a partnership between educational institutions and community organizations to facilitate a greater learning experience for students |
| 9 | Just-in-Time Teaching | Use of brief web-based questions delivered by faculty before a class meeting. Students' responses are reviewed few hours before class and are used to develop classroom activities addressing learning gaps |
| 10 | Role Plays | A problem situation is briefly acted out so that the individual student can identify with the characters and empathize with them. |

Students have an access to an unparalleled range of extra-curricular and co-curricular activities to develop various competencies & skills and develop an extra edge to face the challenges that the corporate world offers

1. **Competency – Role Matrix**

A competency-role matrix is developed for each programme which is a list of skills and behaviours that an engineering graduate needs to exhibit in order to perform well in their careers. The competencies are defined in consideration with the requirement of the industry and to ensure that the students are industry ready by the end of their programme of study.

This competency – role matrix helps students in understanding the different competencies required to observe various job roles. Some competencies are generic in nature and applicable to the full range of employers in the sector, and across the wide variety of roles appropriate to graduates. There are some specific competencies which are appropriate to the specific profession. The Competency – Role matrix is defined in the following format:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Levels/ Roles** | Manager | Design | Production | Maintenance | Quality | Scientist | Research | Flying | Lieutenant | |
|  |  | Engineer | Engineer | Engineer | Control |  | Scholar | Officer |  |  |
| **Competencies**  **/ skills** |  |  |  |  | Manager |  |  |  |  |  |
| Engineering Knowledge | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** |
|  |  |  |  |  |  |  |  |  |  |  |
| Investigation |  |  |  | **√** | **√** |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Modern Tool Usage |  |  |  |  |  | **√** | **√** |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Design/Development  of Solutions |  |  |  |  |  | **√** | **√** |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Communication | **√** |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Individual and Team Work | **√** |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| The Engineer and Society | **√** |  |  |  |  | **√** |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  | |
| Ethics | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | |
|  |  |  |  |  |  |  |  |  |  |  |
| Project Management and Finance | **√** | **√** | **√** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  | |
| Lifelong Learning | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | |
|  |  |  |  |  |  |  |  |  |  | |
| Environment and Sustainability | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | **√** | |
|  |  |  |  |  |  |  |  |  |  |  |
| Problem Analysis |  |  | **√** |  | **√** | **√** |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |

1. **Employability of Graduands -**

In order to develop an understanding of the job prospects available to our students in various sectors, an industry/sector-role matrix has been developed for each programme which defines the roles that student can observe in the relevant industries after completing their programme of study. It maps the prospective job roles with the industry / sectors where the students may be placed after completing their graduation.

The Employability of Graduands are well defined and given in the programme structure of each programme, attached as **Appendix**

1. **Learning Resources**

Amity University has appropriate information & learning resources to support educational objectives of all our management programmes. The University has very rich learning resources as:

* Central and Institutional Library
* Online Journals
* Computer Labs

Appropriate number of books needed for study and teaching as recommended by the course faculty and other experts are maintained in the library.

**Amity Central Library**

The students and Faculty members have an open access to library during the operating hours. University has more than 3,00,000 books and 700 journals

* Amity University Central Library’s sprawling building has three floors of resources which has more than 2,00,000 books, 17,000 e-journals, CDs and many other useful reference materials for students to get knowledge and expertise in their respective fields.
* The 58000 sq ft of knowledge is organized and managed by a dedicated team of Library professionals who are available to guide the students. There are cubicles and Research Rooms for PhD Scholars.
* A large number of computer terminals with Wi-Fi enabled internet facilities is available for students to access the online resources in the Library and search the catalogue of books in KOHA, an advanced Library Software System. They can be checked in the Amity Portal (library.amizone.net).
* Students can search for details of books by title, author, subject or keywords to get to the relevant resource for borrowing.
* The Circulation staff helps in issuing and returns of books and the latest new technological system helps them to self -check in and check out for easy circulation.

In addition to central library some departments have departmental libraries. Amity is also a member of the **British Council Library** and **American Library Centre.**

In addition to the libraries Amity University **has also subscribed to the following on-line journals. :**

1. **UGC- Infonet Digital Library Consortium – about 3559 leading journals**

Under this consortium Amity University has subscribed to a number of Online Journals that are available on Amizone (Intranet) from UGC – Infonet. Through this the Faculty and Students get access to world class online research articles, journals, research papers by the best Publishers, Universities, Research Institutes etc.

1. **EBSCO- host** offers a variety of proprietary of 2300 journals and full text and popular databases from leading information providers.

University is the Institutional Member of **DELNET**, a database that has been established with the prime objective of promoting resource sharing among the libraries through the development of a network of libraries.

1. **Scopus** is a bibliographic database containing abstracts and citations for academic journal article
2. **e-Learning Studio (**Accessing Knowledge Online): e-Learning Studios are for blended teaching-learning.

The libraries have subscriptions to on-line journals and databases in various areas of learning/subjects which are accessible through the intranet from all the terminals. There is a downloading facility for e-material.

The University has over 309 **stat-of-the-art labs** in various domains with high-end Research Equipments.

**External Libraries:**

Amity University is an educational member for various other professional / academic institutions. Students, Faculty and Staff members of the University are given access to avail/utilize the online library of such external institutions. Details of learning resources provided by some of such external libraries are as below:

* **The Association to Advance Collegiate School of Business (AACSB, USA)**
  + **BizEd:** BizEd is an award-winning, bi-monthly magazine on business education. BizEdarticles include interviews with executives, challenges and trends facing business schools, business education news and insights, book reviews, professional development opportunities, and technology advancements in the classroom.
  + **eNEWSLINE and eNEWSLINE Live:** NEWSLINE is a bi-monthly electronic newsletter on business education. It includes business school news, articles from business school deans, data analysis, open business school positions, and more. eNEWSLINE Live is a bi-monthly live broadcast featuring guests from the management education industry.
  + **White Papers:** AACSB International produces a variety of white papers on specific topics for management educators. Topics have included distance learning, faculty qualifications, and Assurance of Learning. White papers are available to the general public for download.
* **Thomson Reuters, USA:** Following Intellectual Property are online accessible:
  + Online Journals
  + eBooks
  + Webinars, etc.

**IT Infrastructure At Amity:**

As a hi-tech smart campuses, Amity University at Noida & Lucknow have wireless broadband internet connectivity with over 75 kms. of fiber optic/ LAN cable backbone structure. Some of the features that it can boast of as part of its hi – tech IT infrastructure are:

* 600 MB Internet Bandwidth from multiple ISP to maintain redundancy and hassle free internet connectivity.
* 40 Servers are Virtualized through VM ware on HP Blades (HP-C3000 with BL 460).
* 24 TB of useable EMC NAS storage with fiber channel connectivity.
* One Network across the country. All Amity Campuses are connected through MPLS VPN of 4MB/2 MB link each.
* High end Catalyst CISCO 6500 Series Switches with Hot Standby Router Protocol ( HSRP) for load balancing and high availability.
* Three Firewall box in redundant mode with high level of content/URL filtering and bandwidth management.
* Mac. Address base authentication for all Wi-Fi users and tracking.
* BGP Router with own IP Pool for bandwidth aggregation and load balancing.
* Campus is covered with high through put Wi-Fi with 400 Nos. APs Access point by using secured and managed Controller of Aruba.
* Centrally IT resource management, monitoring and communication over intranet in between campuses.
* Smart Camera Surveillance with IP Cameras through the Campus.
* Lecture Recordings & Live transmission of ‘on demand’ Class Lectures & Events over Intranet & Internet.

All the faculty members are provided with computers / laptops with internet browsing facility for the preparation of teaching, learning material and research in their respective departments.

1. **Outcome Assessment Plan- Direct and Indirect methods for Assessment of Programme Learning Outcomes –** An outcome assessment plan is developed to ensure that the Programme learning outcomes are assessed, each by atleast one direct and one indirect method. The Assessment tools used to evaluate the extent of accomplishment of each learning outcomes are given in the assessment plan for the Bachelor’s programme of faculty of Engineering and Technology, mentioned as under:

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No** | **PLO’s** | **Direct** | **Indirect** |
|  | The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of aerospace engineering. | **1.** Comprehensive Exam 2. Major Projects (Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. | **1.** Comprehensive Exam 2. Major Projects (Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will create solutions for aerospace engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations. | **1.** Comprehensive Exam 2. Major Projects (Rubrics | Student Exit Survey |
|  | The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions | **1.** Comprehensive Exam 2. Major Projects (Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practice with an understanding of the limitations. | **1.** Comprehensive Exam 2. Major Projects (Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. | **1.** Comprehensive Exam 2. Major Projects (Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. | **1.** Comprehensive Exam 2. Major Projects (Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. | **1.** Comprehensive Exam 2. Major Projects (Rubrics) 3. Behavioral Science Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings | **1.** Comprehensive Exam 2. Major Projects (Rubrics) 3. Behavioral Science Rubrics 4. Foreign Business Language Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will use effective communication to cater to both technical and non-technical audiences | **1.** Comprehensive Exam 2. Major Projects (Rubrics 3. Business Communication  Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team as well as to manage projects in multidisciplinary environments | **1.** Comprehensive Exam 2. Major Projects (Rubrics | 1. Student Exit Survey 2. Industry Internship |
|  | The student will recognize the need for, and will engage in independent and life-long learning in the broadest context of technological change | 1. Comprehensive Exam | 1. Student Exit Survey 2. Industry Internship |

1. **Examination System Progression & Passing Standards –**

**13.1 Attendance**

* 1. Students are expected to have 100% attendance.
  2. Every teaching faculty handling a class will take attendance till the last day of the class. The percentage of attendance upto this day will be calculated and forwarded to Examination Department by the HoI for issue of Admit Cards.
  3. Relaxation of maximum 25% may be allowed to cater for sickness or other valid reasons beyond the control of the students for which written permission of HoI/ HoD is mandatory.
  4. A student whose attendance is less than 75%, whatever may be the reason for shortfall, will not be permitted to appear in the End Semester Examination (ESE).
  5. Under extreme special circumstances, Vice Chancellor may condone attendance up to 5% below 75% on the recommendation of HoI.
  6. **Course Assessment**
  7. The assessment components at the course level are defined in consideration with Course objectives
  8. The assessment plan for the **theory courses** clearly defines the weightage of Continuous Internal Assessment and Final Assessment, which have various components to assess various learning outcomes. The weightage of CIA and Final Assessment is as under:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | **Continuous Internal Assessment** | **Attendance** | **Final Assessment** | **Course Type** |
| 1 | 35 | 5 | 60 | Value addition courses and PSDA based courses. |
| 2 | 25 | 5 | 70 | All other courses |

* 1. **Components of Continuous Internal Assessment (CIA)**

Depending upon the nature of the course, the components of internal assessment may vary. The internal assessment will be completed within the semester. Some of the components of Internal Assessment are as follows:

|  |  |
| --- | --- |
| **S.No.** | **Component of Evaluation** |
| 1 | Case Discussion/Analysis |
| 2 | Presentation |
| 3 | Home Assignment |
| 4 | Project |
| 5 | Seminar |
| 6 | Viva - Voce |
| 7 | Quiz |
| 8 | Class Test (s) |
| 9 | Term Paper |
| 10 | Rubrics |
| 11 | Self-work |
| 12 | Any other, as recommended by the Board of Studies (BoS) |

* 1. **Assessment of Lab based Courses**

The weightage of CIA and Final Assessment for lab/studio based courses will be as under as prescribed in the course syllabus:

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Continuous Internal Assessment** | **Final Assessment** |
| 1 | 40 | 60 |
| 2 | 30 | 70 |

* 1. **Assessment of Non Teaching Credit Courses (NTCC)**

|  |  |  |  |
| --- | --- | --- | --- |
| The weightage of CIA and Final Assessment will be as under as per NTCC regulations and Guidelines: | | | |
|  | | | |
| **S.No.** | **Continuous Internal Assessment** | **Final Assessment** | **Credit Units** |
| 1 | 50 | 50 | > 8 Credit Units |
| 2 | 40 | 60 | 5-8 Credit Units |
| 3 | 30 | 70 | Upto 4 Credit Units |

The breaks up (components and their weightage) of continuous internal assessment are given as under:

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Title** | **(CIA = 40%)** | **(CIA = 50%)** |
| 1 | Timely Registration | 1 | 1 |
| 2 | |  | | --- | | Topics & Synopsis Approval | | 2 | 2 |
| 3 | |  | | --- | | **WPRs**  No. of WPR Submitted)  Satisfactory WPR) | | 8  7 | 10  10 |
| 4 | |  | | --- | | 2 Periodic Progress Review by a board of faculty through presentation | | 8 | 8 |
| 5 | |  | | --- | | 1st Draft on time | | 1 | 1 |
| 6 | |  | | --- | | 2nd Draft on time | | 1 | 1 |
| 7 | |  | | --- | | Final Report (Report with <10% Plagiarism) | | 1 | 1 |
| 8 | |  | | --- | | Final Report timely submission | | 1 | 1 |
| 9 | |  | | --- | | Final Report Assessment | | 10 | 15 |

* 1. **Minimum & Maximum Duration Of Academic Programmes**
  2. The maximum permissible period for completing a programme for the programmes of more than two academic years duration, the maximum permissible period shall be n+2 academic years (four semesters), where “n” represents the minimum duration of the programme. On request from the student and recommendation of HoI/Dean, Vice Chancellor may grant extension of one more year(1) i.e. n+1+(1) for 2 years course
  3. **Grading System**

1. The level of students academic performance as the aggregate of continuous evaluation and end term examination shall be reflected by letter grades on a ten point scale according to the connotation as per Table - A

**TABLE - A**



|  |  |  |
| --- | --- | --- |
| **Grade** | **Qualitative Meaning** | **Grade Point Attached** |
| A+ | Outstanding | 10 |
| A | Excellent | 9 |
| A- | Very Good | 8 |
| B+ | Good | 7 |
| B | Above Average | 6 |
| B- | Average | 5 |
| C+ | Satisfactory | 4 |
| C | Border Line | 3 |
| F | Fail | 0 |
| I | Incomplete | 0 |
| (F) DE | Debarred | 0 |
| AB | Absent | 0 |
| U | Unsuccessful | - |
| S | Successful | - |

**13.5 Passing Criteria**

A student has to fulfill the following conditions to pass in their programme of study:

* 1. A student who has earned minimum number of credits prescribed for their programme as per the Structure, Curriculum and Scheme of Examinations, shall be declared to have passed the programme of study.

1. Internal Assessment Evaluation
   1. A student is required to secure minimum 30% marks to pass in End Semester Examination and minimum aggregate marks 40% to be considered 'PASS' in each course unit. Passing in Internal Assessment is not mandatory
   2. **There will be no provision for re-appearing in any component of Internal Assessment in subsequent semesters.**

*The students who are unable to score passing SGPA & CGPA for award of degree because of having obtained Zero mark in the Internal assessment in any course/courses shall be eligible to repeat the internal assessment of the relevant course/courses in the following cases:*

* + 1. *Extended period (n+1) or (n+2) or beyond as the case may be*
    2. *Year Back*
  1. Students should also pass in each term/semester separately by securing a minimum Semester Grade Point Average (SGPA) of 4.5 for UG on a 10 point scale.
  2. A student who has reappeared/repeated the examination of course unit(s), the best of the two scores obtained shall be taken into consideration for calculating the SGPA and CGPA and eligibility for award of a degree.

**The student must pass in Summer Training / Internship, Project, Dissertation (wherever prescribed), by securing at least C+ Grade.**

**13.6 Promotion to Next Semester/Year**

Promotion will be considered at the end of each academic year.

1. A student will be eligible for promotion from 1st year to 2nd year and so on provided he has minimum SGPA and CGPA as under:

|  |  |
| --- | --- |
| **SGPA (First Year)** | 3.5 |
| **CGPA** | 4.5 |

1. Promotion from 1st year to 2nd year: – If a student does not fulfill the above criteria may be promoted to 2nd year on the recommendation of HoI and he/she will be placed on “Academic Probation” provided he/ she has cleared at least 60% of number of Courses /Credit units.
2. Student who is promoted to next year by meeting the promotion criteria but is not meeting qualifying criteria (passing criteria) for award of degree, will be placed on Academic Probation for one year to improve his/her SGPA/CGPA.
3. A student who is not eligible for promotion will have the option to either Repeat the Year / take an Academic Break/Repeat a Semester or Withdraw from the programme

**13.7 Academic Probation (PAP)**

* + Students who fail to clear Promotion Criteria but are promoted to next Academic Year or not meeting qualifying criteria for award of Degree will be placed on Academic Probation for one year.
  + The student who does not clear the Passing Criteria at the end of the Academic Probation will not be eligible for promotion to the subsequent years. She/he will have the option either to Repeat the Year or Withdraw from the Programme.

**13.8 Promotion with Academic Warning (PAW)**

Students who fail to get promoted under PAP may be promoted to next Academic year under following conditions:-

1. if a student meets passing/promotion SGPA & CGPA criteria but has back papers in any of previous semesters
2. if the student has scored Passing Criteria of SGPA in all semesters except one, in which he/she has Promotion Criteria of SGPA of previous year(s) and also has Promotion Criteria of SGPA & CGPA in current year.

All students who are promoted to next year under PAP/PAW category will be required to sign an Undertaking stating that they are under Academic Probation/ Warning and will be required to score minimum passing/promotion SGPA & CGPA criteria as required at the end of Academic Probation/ Warning Period.

* 1. **Academic Break**
  2. Students who apply for Academic Break and the case is recommended by the Heads of Institutions for justifiable reasons to be recorded, can be granted Academic Break of one year to the students of two years course.
  3. However, the total period to qualify the course will not exceed the prescribed n+1 year for upto two years course and n+2 years for three years and above courses.
  4. **Re-Appearing**
  5. A student who has fulfilled the attendance requirements and is eligible to appear in an Examination, fails to appear in the examination shall be required to subsequently appear in the examination when scheduled for next batch of students on payment of prescribed fee.
  6. A student who has not fulfilled the minimum attendance requirement in any Course Unit(s) shall not be allowed to appear in the end term Examination of that Course Unit but shall be allowed to subsequently appear in the examination when scheduled for the next batch of students, on payment of prescribed examination fee and fulfillment of such eligibility conditions as prescribed in the Regulations.
  7. Guided Self Study Course
     1. All students having back paper are required to register themselves for GSSC within one week (7 days) from the date of commencement of the semester.
     2. Any assignment/evaluation of GSSC will not be considered for award of marks for continuous Internal Assessment.
     3. No Student will be permitted to appear for back paper(s) in the end term examinations without registering for GSSC and getting suitability report from allotted faculty.
  8. A student who has failed to secure minimum C+ Grade (Grade Point 4) in a course unit shall be eligible to re-appear / repeat the examination of such course units with a view to secure minimum qualifying/passing score.
  9. A student, who has failed to secure the required qualifying/passing SGPA i.e. 5.0 for PG Courses shall, in order to secure a passing SGPA, apart from fulfilling the requirements has the option to reappear in the end term examinations also of the Course Units of the concerned term in which he/she desires to improve his/her performance, when these examinations are held on normal schedule.

1. Students who have passed all courses (Minimum C+ Grade) but not meeting Promotion/Passing SGPA criteria i may be permitted to appear in Supplementary Examination with a view to improve grade and score Passing/Promotion SGPA of the respective semesters.
2. Students who are eligible to re-appear in an examination, or are repeating the course(s) shall have to apply to the Controller of Examinations to be allowed to reappear in an examination or to repeat the course(s), and pay the fees prescribed by the University.
3. The Departments/Constituent Units may, at their discretion, arrange for additional teaching in the form of GSSC for students repeating the examination of course(s) during the breaks. The modus operandi of such instructions shall be as notified by the Department/Constituent Unit. Extra fee shall be charged from such students for attending GSSC.

In all cases of re-appearing, the marks obtained by the students who have re-appeared will be converted to the appropriate letter grade not exceeding B+.

* 1. **Supplementary Examinations**
  2. For the final year & pre-final students, supplementary examinations for those who have not secured passing grades, or were debarred/detained from appearing in any examination and they made up the deficiency in attendance as per provisions of these Regulations, will normally be held within thirty days after the declaration of results of the final Semester Examinations.
     1. A student who fails to appear or qualify in Supplementary Examinations shall reappear in the examinations when scheduled for the next batch of students within the time span prescribed for the programme.
     2. A student wishing to appear/reappear in the Supplementary Examination shall apply to the Head of Department/Constituent Unit on line in the prescribed form within fifteen days of the date of declaration of result or date announced by Exam Department along with prescribed Examination Fee.
     3. The eligibility of a student for appearing in the Supplementary Examination shall be verified by the Head of Department/Constituent Unit and a list of eligible students containing the details of Course Units in which the students are recommended for appearing in the supplementary examination shall be forwarded to the Controller of Examinations within one week along with prescribed fee payment receipts, after the last date for submission of examination forms.
     4. Better of two scores obtained after Supplementary Examination in repeat course unit(s) shall be taken into consideration for calculating the SGPA and CGPA and eligibility for award of a degree/diploma.

1. **Academic Discipline** 
   1. **Acts of Unfair Means:**

The following are considered as the act of unfair means:

* Talking to another student or any person, inside or outside the examination hall, during the examination without the permission of a member of the supervisory staff.
* Leaving the examination hall without handing over the answer book and/ or continuation sheet, if any, or any other specifically designed response sheet to the Invigilator or Supervisor concerned or Centre Superintendent or the authorized officer of the University deputed to the examination centre, and taking away, tearing off or otherwise disposing off the same or any part thereof.
* Writing matter connected with or relating to a question or solving a question any thing (such as piece of paper or cloth, scribbling pad) , other than the answer book, the continuation sheet, any other response sheet specifically provided by the University to the student.
* Writing or sketching abusive or obscene expressions on the answer book or the continuation sheet or any other response sheet.
* Deliberately disclosing one's identity or making any distinctive marks in the answer book for that purpose.
* Making appeal to the Examiner/Evaluator soliciting favour through the answer book or through any other mode.
* Possession by a Student or having access to books, notes, paper or any other material, whether written, inscribed or engraved, or any other device, which could be of help or assistance to him in answering any part of the question paper.
* Possession of mobile phone, laptop or any electronic device which can be of help or assistance to the student in answering any part of the question paper.
* Concealing, destroying, disfiguring, swallowing, running away with, causing disappearance of or attempting to do any of these things in respect of any book, notes, paper or other material or device, used or attempted to be used by a student for assistance or help in answering a question or a part thereof.
* Passing on or attempting to pass on, during the examination hours, a copy of a question paper, or a part thereof, or solution to a question paper or a part thereof, to any other student or to any person.
* Smuggling into the examination hall and/ or receiving/attempting to receive an answer book or a continuation sheet, or any other form of response sheet or a solution to a question paper or to a part thereof or taking out or arranging to send an answer book or continuation sheet, or replacing or attempting to get replaced the answer book or continuation sheet or any other response sheet during or after the examination with or without the help of or in connivance with any person connected with the examination, or through any other agency, whatsoever.
* Approaching or influencing directly or indirectly a paper setter, examiner, evaluator, moderator, tabulator or printer or any other person connected with the university examination with the object, directly or indirectly, of influencing him to leak out the question paper or any part thereof, or stealing/procuring the question paper from any source before the examination or to enhance marks, or favourably evaluate, or to change the award in favour of the student.
* Any attempt by a student or by any person on his behalf to influence, or interfere with, directly or indirectly, the discharge of the duties of a member of the supervisory or inspecting staff of an examination centre before, during or after the examination. Provided that without prejudice to the generality of the provision of the clause, this would include any such person who:
  + 1. abuses, insults, intimidates, assaults any member of the supervisory or inspecting staff, or threatens to do so.
    2. abuses, insults, intimidates, assaults any other student or threatens to do so, shall be deemed to have interfered with or influenced the discharge of the duties of the Supervisory and the inspecting staff.
* Copying, attempting to copy, taking assistance or help from any book, notes, paper or any other material or device or from any other student, to do any of these things or facilitating or rendering any assistance to any other student to do any of these things.
* Arranging to impersonate for any person, whosoever he may be, or for himself or impersonating for the other student at the examination.
* Forging a document or using a forged document knowing it to be forged in any manner relating to the examination.
* Any other act of omission or commission declared by the Academic Council/Executive Council to be unfair means in respect of any or all the examinations.

**14.2 Discipline Committee:** A student discipline committee is constituted to ensure disciplinary control in the University

* 1. At the time of admission, every student signs a declaration that on admission, he submits himself to the disciplinary jurisdiction of the Vice Chancellor and several authorities of the University vested with the authority to exercise discipline.
  2. Without prejudice to the generality of the power to maintain and enforce discipline, the following amounts to acts of indiscipline or misconduct on the part of a student of the University:
     1. Physical assault or threat to use physical force against any member of the teaching and non-teaching staff of any Department / Institution / School / College / Constituent Unit / Centre and against any student within Amity University Uttar Pradesh.
     2. Unauthorisedly remaining absent from the class, test or examination or any other curricular or co-curricular activity which he/she is expected to participate in.
     3. Carrying of, use of or threat to use of any weapons.
     4. Misbehavior or cruelty towards any other student, teacher or any other employee of the University, a college or institution.
     5. Use of drugs or other intoxicants except those prescribed by a qualified doctor.
     6. Any violation of the provisions of the Civil Rights Protection Act, 1976.
     7. Indulging in or encouraging violence or any conduct which involves moral turpitude.
     8. Any form of gambling.
     9. Discrimination against any student or a member of staff on grounds of caste, creed, language, place of origin, social and cultural background or any of them.
     10. Practicing casteism and untouchability in any form or inciting any other person to do so.
     11. Any act, whether verbal or otherwise, derogatory to women.
     12. Smoking, use of narcotics, possession and consumption of alcoholic beverages or gambling in any form.
     13. Any attempt at bribing or corruption of any manner or description.
     14. Willful destruction of the property of the University or its Departments / Institutions / Schools / Colleges / Constituent Units / Centre’s etc.
     15. Behaving in rowdy, intemperate or disorderly manner in the premises of the University or the college or the institution, as the case may be, or encouraging or inciting any other person to do so;
     16. Creating discord, ill-will or intolerance among the students on sectarian or communal grounds or inciting any other student to do so
     17. Causing disruption of any manner of the academic functioning of the University system
     18. Indulging in or encouraging any form of disruptive activity connected with tests, examinations or any other activity of the University or the college or the institution, as the case may be
     19. Unpunctuality
     20. Ragging
     21. Violation of the status, dignity and honour of students, in particular female students and those belonging to a scheduled caste or a scheduled tribe or other backward class
     22. Any practice whether verbal or otherwise, derogatory to women
     23. Verbal abuse, mental or physical torture, aggression, corporal punishment, harassment, trauma, indecent gesture and obscene behaviour of students
     24. Indulging in or encouraging any form of disruptive activity connected with tests, examinations or any other activity of the University or the college or the institution, as the case may be.

**13.3 Anti Ragging Cell:** A cell is constituted to ensure that students do not induldge in any kind of ragging activities. Following comes under ragging and accounts to disciplinary action

* 1. Any conduct by any student or students whether by words spoken or written or by an act which has the effect of teasing, treating or handling with rudeness a fresher or any other student.
  2. Indulging in rowdy or indisciplined activities by any student or students which causes or is likely to cause annoyance, hardship, physical or psychological harm or to raise fear or apprehension thereof in any fresher or any other student;
  3. Asking any student to do any act which such student will not in the ordinary course do and which has the effect of causing or generating a sense of shame, or torment or embarrassment so as to adversely affect the physique or psyche of such fresher or any other student.
  4. Any act by a senior student that prevents, disrupts or disturbs the regular academic activity of any other student or a fresher;
  5. Exploiting the services of a fresher or any other student for completing the academic tasks assigned to an individual or a group of students;
  6. Any act of financial extortion or forceful expenditure burden put on a fresher or any other student by students;
  7. Any act of physical abuse including all variants of it: sexual abuse, homosexual assaults, stripping, forcing obscene and lewd acts, gestures, causing bodily harm or any other danger to health or person;
  8. Any act or abuse by spoken words, emails, post, public insults which would also include deriving perverted pleasure, vicarious or sadistic thrill from actively or passively participating in the discomfiture to fresher or any other student;
  9. Any act that affects the mental health and self-confidence of a fresher or any other student with or without an intent to derive a sadistic pleasure or showing off power, authority or superiority by a student over any fresher or any other student.

**13.4 Prohibition of Ragging**

1. Ragging within the University Campus including its Institutions / Departments /Hostels or/ and any part of Amity University system as well as on public transport system outside the campus is strictly prohibited.
2. Ragging in any form is prohibited also in the private lodges/buildings where these University students are staying.

1. **Student Support System & Services – In order to provide support to students, following systems are in place**

**15.1 – Amizone -** The University has an intranet known as “**Amizone**” where information and learning resources are uploaded regularly. The following are the online facilities under Amizone:

* + On-line journals
  + Conference / Workshop / Seminars
  + Session Plan and Course materials
  + Class Time-table / Schedule
  + Student’s Handbook
  + University Regulations & Guidelines
  + Syllabus and Programme Structures for various batches / semesters / programmes
  + Display of various information/circulars/notices such as:
    - Academic Calendar
    - Examination schedule
    - Calendar of events and event details with photos
    - Guidelines for Placements, Events, Guest Lectures, Projects, Term Papers, Farewell Party, Orientation Programmes etc.,
    - Holidays list
    - Invites are being sent for various conferences, meets, summits and admission boards
    - Online poll/Quiz

**15.2 Programme Leaders/Coordinators –** A programme leader is appointed for every programme who is responsible for:

* Timely uploading of information on Amizone
* Dissemination of information related to academics to all the students enrolled in the respective programme
* Addressing students’ queries and doubts
* Smooth conduct of routine activities

**15.3 Guided Self Study Course (GSSC)** - Guided Self Study courses are conducted to prepare the students for back papers

* The institutions prescribe “ Guided Self Study Course” for the course units in which the students failed or are detained due to shortage of attendance in a semester and arrange counseling sessions for the students on week ends and holidays in the same odd or even semesters.
* The students who are detained due to shortage of attendance in any subject of a semester shall register with their Department/Constituent Unit for guided self study course in the beginning of next semester/trimester/year scheduled for next batch of students. They will be required to pay a fee per subject as prescribed by the Department/Constituent units.
* The Departments/Constituent Units may prescribe term papers / home assignments which the students will submit to their teachers subject-wise within the due dates.
* The regularity in attending the classes and prompt submission of assignments by due date will determine whether a debarred or detained candidate is permitted to take the re-examination or not. The schedule for regular collection and submission of term paper/ home assignments will be announced by the Department/ Constituent Unit.
* Only those students who register for Guided Self Study Course (GSSC) and complete the requirements as prescribed by the Department/Constituent Units will be permitted to take the examination in the respective subject when the examinations of such Course Units are conducted in normal schedule along with the next batch of students. The scheme of re-examination will be announced by the University on receipt of report from the Department/Constituent Unit. The student will be permitted to appear in examination on satisfactory performance in GSSC.

**15.4 Class Representative (CR) System** - A Class Representative is a responsible, prestigious and challenging position. Students are encouraged to take up this leadership position. To become a representative of the class, a student must have the values of trustworthiness, honesty, transparency and commitment.

The roles and responsibilities of the Class Representative –

Class Data Collection & Analysis: for each student for various activities and issues.

* + Advocacy: influencing the student community for positive outcomes with respect to academics, discipline and participation in co-curricular and extra-curricular activities.
  + Monitoring: attendance, time table, syllabus progress, discipline and related issues.
  + Quality enhancement: by representing the legitimate concerns and problems of classmates and giving feedback to both the classmates and authorities.
  + Coordination: with various authorities in the Institute and University.

**15.5 Mentor-Mentee System** - Mentoring is to support and encourage students to manage their own learning in order that they may maximise their potential, develop their skills, improve their performance and become the person they want to be.

Mentoring is a partnership between two people, Mentor & Mentee, based on mutual trust and respect.

At Amity, mentoring encourages students to take guidance and develop partnerships with four types of mentors:

* + Faculty Mentor
  + Alumni Mentor
  + Industry Mentor
  + Parent Mentor

All four Mentors jointly collaborate towards the development of the student through a process of experiential guidance and learning.

Every Amity institution arranges appointment of faculty, industry and alumni mentor for each student. Formal meetings are scheduled between mentors and mentees so that learning is progressed across functions, groupings, and cultures for maximum benefit. Students aims are decided mutually between mentor and mentee and the progress towards the desired goals would be tracked throughout the duration of his/her stay with Amity. We are proud to say that our mentoring system is unique to Amity and has helped many of our students stand out amongst their peers. They have excelled on both their personal and professional fronts as a result of the mentoring system.

15.6 **Educational Loan, Financial Support and Scholarships** - Amity University offers a variety of scholarships to the meritorious students. The scholarship is in the form of financial aid. Following are the types of scholarships offered to the Amity students:

1. On Admission Merit Scholarship – There are three types of these scholarships as mentioned below:
   * 100% Dr. Ashok K. Chauhan Scholarships
   * 50% On Admission Merit Scholarships
   * 25% On Admission Merit Scholarships (Applicable to Lucknow Campus)

These scholarships are granted at the time of admission on the basis of school and /or graduation results. Scholarship is granted on annual basis and continuation in second and further years of the program is subject to the academic performance (Merit List based on CGPA) & other conditions as laid down in the regulations.

1. On Admission Sports Scholarship – To attract talent in sports scholarship are given –
   1. 100% Scholarship – International Players\*
   2. 50% Scholarship – National Medal Winners\*
   3. 25% Scholarship – National Participation\*
2. Merit-Scholarship During the Programme – These scholarships are granted from second year onwards for encouraging students to achieve higher performance during their studies in their respective academic programme. The amount of scholarship is 30% of the academic year tuition fee. The number of scholarships depends upon the no. of students in the programme. (max.limit is three).
3. Merit-Cum-Means (MCM) Scholarship - These scholarships is granted to the students who are academically good and need financial assistance to continue their education in the University. The amount of scholarship is upto 50% of academic year tuition fee. Students need to apply for such scholarships to their respective Head of Institution as per the prescribed format (uploaded on Amizone) & support documents at the commencement of the Academic Session. Continuation of the scholarship is based on students' merit, academic & extra/co-curricular activities performances & family financial position.
4. Special Scholarships - These scholarships are granted to the students showing extraordinary achievements in extra- curricular activities. The amount of scholarship depends on individual cases. Students are required to apply for the same as per the prescribed format (uploaded on Amizone) at the commencement of the Academic Session.
5. Other Scholarships – These scholarships are instituted by Grants from individuals, Trusts, Organizations, Institutions etc with a view to provide financial assistance to needy students

15.7 **Medical Services** - Hostellers are advised to get themselves inoculated against communicable diseases at their own initiative and expense.

First-aid Medical Treatment is available within the campus. Amity Clinic has a resident doctor and nursing staff. Students contributing to group medi-claim policy are provided medical treatment of up to Rs 25,000/- in the following hospitals - Kailash Hospital (Noida), Indraparstha Apollo Hospital (New Delhi), Noida Medicare Centre, Vinayak Hospital (Noida).

On falling sick, the hostellers are to inform the Warden who will arrange medical help. If a hosteller is advised hospital admission, necessary communication is sent to parents/local guardians, Programme Director and Director Finance. Amity University also offers a medical insurance plan to all students.

15.8 **Career Counseling & Placement**

Amity endeavors to nurture competitive and accomplished business leaders, entrepreneurs and professionals. The Corporate Resource Center (CRC) at Institutional level, is established to groom the students to take up the corporate responsibilities, soon after they pass out from the campus

The CRC provides holistic comprehensive career-planning services to students by providing expertise, resources, and support. The CRC empowers students to build bridges to successful future careers.

It aims to help students make a successful transition from their educational environment to employment or further educational pursuits. The programs and services are designed to increase the students’ confidence and provide the necessary skills and information to succeed in pursuing a career.

15.9 **Guidance and Counseling Cell** - Students face difficulties like separation from their families, growing up and learning to function as independent adults, developing new and closer relationships, as well as defining and establishing themselves on a possible career. The counseling center is committed to provide a broad range of high quality, innovative and ethical services that address the psychological, educational, social and development needs of the students.

Students are advised to make full use of the ACGC whenever they wish to share thoughts regarding their emotional, personal & professional needs. All interactions with students are kept strictly confidential.

15.10 **Amity Women Help Desk**

Amity Women Help Desk has been established as a part of the measures undertaken for the welfare of the female fraternity of the University. Following the UGC mandate, it focuses on women safety and security in all respects and provides support services to ensure safe environment.

Female students, faculty and staff members may contact Amity Women Help Desk 24X7 for any kind of complaints (sexual, physical, psychological /emotional harassment etc.,), queries and suggestions. The same may be posted on Amizone (Amity intranet).

The help Desk acts as a link between the complainant and Redressal Authority in the University and ensure grievance redressal within a stipulated period of time.

15.11 **Suggestions and Grievance Redressal System** - In order to make student's stay in AUUP comfortable and stress free, Amity has a multi layered student grievance redressal system. Student having a problem will approach the Academic and General Counseling Cell at his/ her department level. Student's problems that cannot be resolved at the department level will be referred to the appropriate Committee. Issue will definitely get resolved within a short period of time.

* 1. The suggestion / grievances by students/parents can also be sent on-line through Amizone.
  2. In addition, problems related to the wellbeing of students warranting urgent attention can be submitted directly to the Dean Student Welfare (msahni@amity.edu) and/or Students Satisfaction and Happiness Mission (SSHM) at sshm@amity.edu
  3. Pursuant to regulation of UGC on promtion of Equity in HIE's as notified in the Gazette of India, dated January 19, 2013, all the issues related to “Equity” as defined in the said UGC Regulations shall be dealt by Equal Opportunity Cell, constituted for the purpose.

**16 Extra-curricular and Co-curricular activities**

Various Extra curricular and Co-curricular activities are organized beyond classroom for the holistic development of students. Some of the activities are:

1. Club –Committee Activities

* Sports Club
* Cultural Committee
* Specialty Club, eg. Marketing Club, HR Club, IT Club, Robotics Club, etc.
* Placement Committee
* Alumni Committee

1. Conferences, workshops seminars, etc
2. Inter-University competitions, Sports Competitions, corporate competitions
3. Conducting Outdoor Activities Based Courses (OABC) which includes
   * + Military training camps (MTC) for both boys and girls
     + Imparting training to students through amity cadet corps (ACC)
     + Human Values and Community Outreach (HVCO)Course
     + Entrepreneurship Awareness Camps(EAC)
     + Performing Arts (PA) Courses
     + Basic skills course in sports
     + Yoga classes for mental and physical wellbeing
4. Human Values Quarter/year where students organize various activities such as blood donation camp, visit to old age homes, spastic children home & orphanages etc, street plays, awareness campaigns, debates etc.

**17 Relevant Policy, Regulations & Guidelines**

The students are governed by the regulations and guidelines of AUUP and such other regulations and guidelines as may be notified by AUUP from to time. It is important that the students read these regulations and guidelines, already available in the 'Amizone' which can be accessed by the students using their password.

**17.1 Regulations**

1. Conduct of Examinations Scheme of Evaluation and Discipline among Students in Examinations.
2. Research Degree Programmes: M.Phil, Ph.D and Post-Doctoral Programmes D.Litt, D.Sc. and LLD.
3. Lateral Entry Admissions and Transfer of Credits.
4. Maintenance of Discipline among Students.
5. Hostel Accommodation.
6. Scholarship, Awards, Medals and Special Awards.
7. Conduct of Convocation.
8. Admissions & Enrolment of Students and Examination & Evaluation for Distance Learning Programmes.
9. Admissions & Enrolment of Students and Examination & Evaluation for Online Programmes.
10. Prevention of Sexual Harassment.
11. Regulation/ Directive for Banning Ragging & Anti-Ragging Measures.
12. Regulations on Choice Based Credit System

**17.2 Guidelines**

1. Attendance for Official Duty.
2. Conduct of Concluding Ceremony.
3. Student's educational Tour/Industry visits/Seminars/Conference.
4. Guidelines for Fresher's Party.
5. Guidelines for Farewell Function.
6. Library Guidelines.
7. Students Grievance Redressal.
8. Guidelines for PG students for early joining for final placement.
9. Mentoring Programme.
10. Project Training.

**18 Concluding Ceremony**

There has been a tradition at the Amity Institutions to conduct a Concluding Ceremony when the students of a programme have undergone and completed all the academic activities of a programme. The students of the outgoing batch are awarded Provisional Certificate for completion of the programme and selected students are presented awards (in the form of Citations, Salvers, Books etc.) in recognition of their contribution and achievements in various fields.

**19 Convocation**

Amity Convocation for successfully qualified Graduands of several Programs, is held every year in the month of December for award of Degrees/ Diplomas, Medals (Gold, Silver and Bronze), Trophies, Citations and Corporate Awards. Few selected eminent personalities having outstanding contribution in their respective fields, are also conferred upon honorary degrees to acknowledge their work. Alumni are specially invited for the Convocation, and during the ceremony, they handover the flag to the passing out graduands to welcome them for being part of the great Amity Alumni Family.

**Appendix**

**a. Definition and Descriptions**

Thus, in framing a suitable curriculum for the *programme in* Management *domain,* the following definitions/descriptions must be followed. This is expected to help in maintaining uniformity of preparing the final programme structure, *Syllabi* and scheme of instructions for *Programmes* offered by various institutions.

***Semester System:*** Each*Master’s programme in* Management *domain* to be ordinarily of 2 academicyears (=4 Semesters) with the year being divided into two Semesters, each for course work, followed by Continuous Assessment *(CA/IA)* in the Semester & End Semester Examination *(ESE)*.

**Annual Academic Calendar -** Amity University follows semester system for conduct of classes. Annual Academic calendar have odd Semesters (I, III) and even semesters (II, IV). Date of Commencement of each semester and last teaching day of semester is finalized well in advance in the detailed ‘Annual Academic Calendar’ for a programme in accordance with ‘Block Academic Calendar’ of the University.

***Credit System:***A system enabling quantification of course work, with *one credit* *being assigned to each unit* after a student completes its teaching-learning process, and assessment (both *CA/IA & ESE).* Further, *Choice Based Credit System* *(CBCS)* to be helpful in customizing the course work for a student, through *Core & Electives (both professional and open electives).*

***Credit Courses:*** All Courses registered by a student in a*Semester*to earn*credits*; In awidely accepted definition, students to earn *One Credit* by registering and passing:

* + One hour/week/Semester for *Theory/Lecture (L) Courses;* or *Tutorials (T)* and,
  + Two hours/week/Semester for *Laboratory/Practical(P) Courses;*

***NOTE****:* Other student activities not demanding intellectual work or enabling properassessment like, study tour, club Committee activities and guest lectures not to carry *Credits;*

***Credit Representation:*** *Credit*values for different academic activities to berepresented by following the well accepted practice, as per the example in Table 1:

**Table 1: Credit Representation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Lectures | Tutorials | Practical Work | Self-work |  |  |
| (hrs/wk/Sem.) | (hrs/wk/Sem.) | (hrs/wk/Sem.) | (hrs/wk/Sem.) | *Credits* | Total |
|  |  |  |  | (L: T: P:SW) | *Credits* |
| 3 | 0 | 0 | 0 |  |  |
| 2 | 2 | 0 | 0 | 3:0:0:0 | 3 |
| 2 | 0 | 2 | 0 | 2:2:0:0 | 4 |
| 2 | 2 | 2 | 0 | 2:0:1:0 | 3 |
| 0 | 0 | 6 | 0 | 2:2:1:0 | 5 |
| 2 | 1 | 2 | 2 | 0:0:3:0  2:1:2:2 | 3  5 |

*One Credit Unit will be equivalent to 10-12 hrs of Classroom Teaching (L-T) and 20-24 hrs of Lab practical’s and 50-60 hrs of field work/industry work.*

***Course Load:*** Every student to register for a set of*Courses*in each*Semester,*withthe total number of their *Credits* being limited by considering the permissible *weekly* *Credit hours load: 30/Week*. This is meant to enable the students to engage in home work assignments, self-learning outside the Class rooms/Laboratories, Extra/Co-Curricular activities and *add-on Courses,* if any, for their overall development. UGC guidelines prescribe:

* **The total periods provided for contact teaching shall not be less than 30 hours a week.**
* **The time provided for practical, fieldwork, Library, utilization of computer and such other facilities shall not be less than 10 hours a week**

***Course Registration:*** Every student to formally re-register for programme and prescribed *Courses (Credits)*under ***HoD/PL/PC*** advice in each *Semester* for the Institution to maintain proper record; Helpful for monitoring the *CA/IA, ESE* performance in each case and to assist the students in self-paced learning by dropping/withdrawing from *Course(s)* and add new programmes to avail *Course* *Flexibility for CBCS with prior approval of Course Advisory Committee (CAC)/HoI.*

***Course Evaluation:*** *CA/IA*and*ESE*to constitute the major evaluations prescribed foreach *Course,* with only those students maintaining a minimum standard in *CA/IA* (to be fixed by the institution) being permitted to appear in *SEE* of the *Course; CA/IA* and E*SE* to carry 30% & 70% or 40% & 60% respectively, to enable each *Course* to be evaluated for 100 marks, irrespective of its *Credits;*

***CA/IA:*** To be normally conducted by the*Course faculty*and include mid-term/weekly/ fortnightly class tests, home work, problem solving, group discussion, quiz, mini-project & seminar throughout the *Semester*, with weightage for the different components being fixed at the institutional level; *Faculty* also to discuss on *CA/IA* performance with students;

***ESE:*** To be normally conducted at the institutional level as per the University Examination regulations and guidelines.For this purpose, *Syllabi* to be modularized and *ESE* questions to be set fromeach module, with choice if any, to be confined to module concerned only. The questions to be comprehensive emphasizing analysis, synthesis, design, problems & numerical quantities;

***Grading:*** To be normally done using*Letter Grades*as qualitative measure ofachievement in each *Course,* as described in student handbook and examination regulations, based on the marks(%) scored in *(CA/IA+ESE)* of the *Course* and conversion to *Grade* done by *Relative Grading.*

***Grade Point(GP):***Students to earn*GP*for a*Course*based on its*Letter Grade;*e.g., ona typical 10-point scale, *GP* to be: *A+=10, A=09, A-=08,B+=07,B=06,B-=5, C+=04 & F=00;* Useful to assess students‟ achievement quantitatively & to compute *Credit Points* *(CrP)= GP X Credits* for the *Course;* Student passing a *Course* only when getting *C+ Grade.* Minimum passing marks in a course shall be 40%

***Grade Point Average(GPA):***Computation of*Semester GPA (SGPA)*to be done bydividing the sum of *CrP* of all *Courses* by the total number of *Cr* registered in a Semester, leading finally to *CGPA* for evaluating student’s performance at the end of two or more *Semesters* cumulatively; This reform serving as a better performance index than total marks or %;

***Passing Standards:*** Both*SGPA & CGPA*serving as useful performance measures inthe *Semester System;* Student to be declared successful at the *Semester-end or* *Programme-end* only when getting *SGPA >=5 and CGPA >=6.00 for Master’s Degree.*

***Credits Required for Degree Award:*** Number of*Credits*to be earned by a studentfor the *Award* of degree fixed by Institutions and approved by Academic council to be normally in the range of:

* *Master’s Degree programme in* Management - 100- 117 Credit Units (CU) i.e. equivalent to 30+hrs /Sem.

**Organization of Course Curriculum:** The Content of each Course has been organized into:

* **Course Description:** general introduction to the course
* **Course Objectives:** to elucidate the basic aims of the course
* **Pre-Requisite:** courses, Equivalent skills or prior experience that a student possesses that prior to registration in a specific course
* **Student Learning Outcomes (SLOs):** focus on the intended abilities, knowledge, values, and attitudes of the student after completion of the program
* **Course Syllabus –** having 5-6 modules having topics/descriptors under each module depending depth, width to be covered in order to achieve the course objectives and Student learning Outcomes.
* **Teaching Learning Pedagogy:** an array of different teaching learning strategies best suitable for the delivery of particular course used in different combinations to improve learning outcomes.
* **Assessment Plan -** The plan providing details of all methods of assessing student learning within the classroom environment, using course goals, objectives and content to gauge the extent of the learning that is taking place.
* **Text Books & Reference Books –** list of books that matches the course contents
* **Additional reading material –** list of journals, research papers or any other study material other than books which can be referred by student

**Model Curriculum Framework / Programme Structure:** The Model Framework includes following:

* + Programme description: brief introduction of the programme
  + Programme Educational Objectives/goal: statements that describe the expected accomplishments and professional status of the students after completion of the program
  + Programme Learning Outcomes: describes the measurable knowledge, skills, abilities, or behaviors that students to be able to demonstrate by the time they complete their degree
  + Curriculum Programme Structure /Framework - defines the course type and credit structure semester wise and overall credits prescribed as per University norms
  + Outcome Assessment Plan: The plan providing details of all methods of assessing student learning outcome in the programme to gauge the extent of the learning that is taking place. (As per attached format)
  + Employability of Graduands: embedding set of attributes in the curriculum and imparting knowledge to develop desired skills & competencies and equip students to compete in the global marketplace
  + Resource Planning

**Outcome Based Education System** - The Learning outcomes are clearly defined at the programme level and course level. The **Programme Learning Outcomes (PLOs)** describes the student learning, i.e. what students will know and be able to do as a result of completing the programme. The **Student Learning Outcomes** (SLOs) describes the learning of student after completing a course.

**Course Types**

|  |  |  |
| --- | --- | --- |
| **#** | **Course Types** | **Description** |
| **1** | Core Courses | Courses that are relevant to the chosen specialization/branch of particular programme and must successfully be completed to receive the Degree and which cannot be substituted by any other course. |
| **2** | Allied Courses | These courses are from the allied / multidisciplinary area which supports the main discipline. Students have to take all the courses offered as allied by the institution and there is no choice available with them |
| **3** | Specialisation Elective Courses | These courses are discipline centric and students make a choice of courses from the list of specialization electives offered by the institution. They are relevant to the chosen specialization/branch of a particular programme |
| **4** | Mandatory Courses | Course work on peripheral subjects in a programme, wherein familiarity considered mandatory. These courses are included as non-Credit Courses with only a pass in each required to qualify for award of Degree from the concerned institution. |
| **5** | Open Elective Courses | Courses offered by other domains and chosen as per interest of the students. This course can be chosen from a **Basket of courses** and provides an extended scope and exposure to some other discipline/ domain or nurtures the candidate’s proficiency/ skill. |
| **6** | Domain Electives | These courses are offered by the institutions under the same domain of study. Numbers of courses are offered by the institutions under the same domain and the students make their choice as per their interest and academic abilities |
| **7** | Value Addition Courses | VAC is considered as add on courses to add professional and ethical values in students. The courses like Behavioral Science, Business Communication (BC), Business Communication/ Communication Skills and Foreign Business Language (FBL) under VAC. Multiple Language Options such as Sanskrit, Russian, Chinese, Arabic, Japanese, French, and German & Spanish are being offered and it's mandatory that a student takes one language in each semester. A student can not choose more than one language during the programme of study. |
| **8** | Non Teaching Credit Courses | Non Teaching Credit Courses are self exploratory courses for professional development of students as well as to allow them to pursue their interest. It includes Summer Training, Dissertation, Term paper, Seminar and/or Minor project; these courses are conducted as per University Guidelines. |
| **9** | Outdoor Activity Based Courses (OABC) | OABC are offered centrally to all the students of UG and PG level. These are general education courses which includes courses like Military Training Camp (MTC), various Sports and Human Values & Community Outreach |
| **10** | Study Abroad Programme (SAP) Courses | SAP courses are offered in lieu of Open Electives, Domain Electives, Specialisation Electives, Outdoor Activity Based Courses and Value Addition Courses. The compulsory /core courses of a programme and their credits are not permitted to be replaced by other courses studied and assessed during SAP. |
| **11** | Skill Enhancement Courses | Skill enhancement courses are designed to develop the profession skills of students in the chosen area of study so that the students become industry ready. |

**B. Programme structure of B.Tech ( Aerospace Engineering), Batch 2016-20,**

**Batch 2017-21, Batch 2018-22, and Batch 2019-23.**

**Programme structure of B.Tech ( Aerospace Engineering), Batch 2016-20**

**Programme Description:** It is a graduate programme with specialization in aerospace engineering which deals with the design, construction, and study of the science behind the forces and physical properties of aircraft, rockets and flying crafts. The curriculum is developed such that student learns fundamental and advanced subjects of aerospace engineering. The knowledge obtained through this programme enables student to be successful professional in the field of aerospace engineering.

**Programme Educational Objectives/Goals:**

|  |  |
| --- | --- |
| **PEO1** | The students shall have the ability to apply knowledge of mathematics, science, computing and engineering for research, design and development of novel products and solutions as an individual/ member of a team/ leader in diverse teams and as an entrepreneur. |
| **PEO2** | The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. |
| **PEO3** | The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams. |
| **PEO4** | Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. |
| **PEO5** | The student will have the ability to support and practice independent and life-long learning for professional development. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Programme Structure as per prescribed programme framework** | | | | | | | |
| **Semester I** | | | | | | | |
| **Course Code** | **Course Title** | **Course Type** | **Credit** | | | | **Credit Units** |
|  |  |  | L | | T | P/S/FW |  |
| ECON132 | Economics for Engineers | Humanities, Social Science & Management Courses [3] | 2 | | - | - | 2 |
| SOC104 | Sociology for Engineers | 1 | | - | - | 1 |
| LS104 | Biology for Engineers | Basic Science courses  [14] | 3 | | - | - | 3 |
| MATH114 | Applied Mathematics - I | 3 | | - | - | 3 |
| PHYS101 | Applied Physics – I | 2 | | 1 | 1 | 4 |
| CHEM101 | Applied Chemistry | 2 | | 1 | 1 | 4 |
| ES103 | Basic Electrical Engineering | Engineering Science Courses  [5] | 2 | | 1 | 1 | 4 |
| ES104 | Engineering Graphics Lab | - | | - | 1 | 1 |
| **Value Addition Courses** | | | | | | | |
| ENG101 | English Language Usage Essentials | Communication skills [1] | 1 | | - | - | 1 |
| BS101 | Understanding Self for Effectiveness | Behavioral Science [1] | 1 | | - | - | 1 |
| **Choose any one of the following** | | | | | | | |
| FREN101 | Introduction To Francophone Culture | Foreign Business Language [2] | | 2 | - | - | 2 |
| GRMN101 | Introduction To German Culture |
| SPAN102 | Introduction To Hispanic World |
| JPAN101 | Introduction To Japanese Culture |
| CHIN101 | Introduction To Chinese Culture |
| ARAB101 | Introduction To Arabic Culture |
| RUSS101 | Introduction To Russian Culture |
| SANS101 | Introduction To Vedic Culture |
|  |  | Outdoor Activity Based Courses [0-1] | | - | - | - | 0-1 |
| Total number of credits | | | | | | | 26 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Semester II** | | | | | | |
| **Course Code** | **Course Title** | **Course Type** | **Credit** | | | **Credit Units** |
|  |  |  | L | T | P/S/FW |  |
| HIST113 | Elements of Indian History for Engineers | Humanities, Social Science & Management Courses [3] | 1 | - | - | 1 |
| LAW132 | Law for Engineers | 2 | - | - | 2 |
| MATH122 | Applied Mathematics – II | Basic Science courses  [11-14] | 3 | - | - | 3 |
| PHYS113 | Applied Physics - II | 2 | 1 | 1 | 4 |
| EVS101 | Environmental Studies | 4 | - | - | 4 |
| ES101 | Engineering Mechanics | Engineering Science Courses  [5-8] | 3 | - | 1 | 4 |
| ES102 | Elements of Mechanical Engineering Lab | - | - | 1 | 1 |
| ES202 | Introduction to Computers and Programming in C | 2 | - | 1 | 3 |
| **Value Addition Courses** | | | | | | |
| ENG111 | Introduction to Communication Skills | Communication skills [1] | 1 | - | - | 1 |
| BS102 | Individual Society & Nation | Behavioral Science [1] | 1 | - | - | 1 |
| **Choose any one of the following** | | | | | | |
| FREN104 | French Grammar – I | Foreign Business Language [2] | 2 | - | - | 2 |
| GRMN104 | German Grammar – I |
| SPAN103 | Spanish Grammar – I |
| JPAN102 | Japanese Grammar – I |
| CHIN102 | Chinese Grammar – I |
| ARAB102 | Arabic Grammar – I |
| RUSS102 | Russian Grammar – I |
| SANS102 | Sanskrit Grammar – I |
|  |  | Outdoor Activity Based Courses [0-1] | - | - | - | 0-1 |
| Total number of credits | | | | | | 26 |
| \*Term Paper of 1 credit during summer break after 2nd Semester & evaluation in 3rd Semester | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Semester III** | | | | | | | | |
| **Course Code** | | **Course Title** | **Course Type** | **Credit** | | | | **Credit Units** |
|  | |  |  | L | | T | P/S/FW |  |
| MATH201 | | Numerical Methods and Optimization | Basic Science  courses [3-4] | 3 | | 1 | - | 4 |
| MATS201 | | Material Science | Engineering Science Courses  [10-11] | 2 | | - | - | 2 |
| ES201 | | Basic Electronics Engineering | 3 | | - | 1 | 4 |
| ES203 | | Object Oriented Programming Using C ++ | 3 | | - | 1 | 4 |
| MAE202 | | Mechanics of Solids | Core Courses  [8-11] | 2 | | - | - | 2 |
| MAE201 | | Mechanics of Fluids | 3 | | - | - | 3 |
| AERO201 | | Elements of Aerospace Engineering | 2 | | - | - | 2 |
| MAE212 | | Thermodynamics | 2 | | - | - | 2 |
| **Value Addition Courses** | | | | | | | | |
| BC201 | | Effective Written Communication | Communication Skills [1] | 1 | | - | - | 1 |
| BS201 | | Problem Solving & Creative Thinking | Behavioral science [1] | 1 | | - | - | 1 |
| **Choose any one of the following** | | | | | | | | |
| FREN105 | French Written Expression & Comprehension – I | | Foreign Business Language [2] | | 2 | - | - | 2 |
| GRMN105 | German Written Expression & Comprehension – I | |
| SPAN105 | Spanish Written Expression & Comprehension – I | |
| JPAN103 | Japanese Written Expression & Comprehension – I | |
| CHIN103 | Chinese Written Expression & Comprehension – I | |
| ARAB103 | Arabic Written Expression & Comprehension – I | |
| RUSS103 | Russian Written Expression & Comprehension – I | |
| SANS103 | Sanskrit Written Expression & Comprehension – I | |
| ETNT201 | Term Paper- Mandatory Course | | Mandatory Course | | - | - | - | 1 |
|  |  | | Outdoor Activity Based Courses[0-1] | | - | - | - | 0-1 |
| Total number of credits | | | | | | | | 27 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Semester IV** | | | | | | |
| **Course Code** | **Course Title** | **Course Type** | **Credit** | | | **Credit Units** |
|  |  |  | L | T | P/S/FW |  |
| STAT233 | Probability & Statistics | Basic Science courses [4] | 3 | 1 | - | 4 |
| ES204 | Basic Simulation Lab | Engineering Science Courses  [1] | - | - | 1 | 1 |
| AERO202 | Aerodynamics - I | Core Courses  [16-17] | 3 | 1 | 1 | 5 |
| AERO203 | Propulsion - I | 3 | 1 | 1 | 5 |
| AERO204 | Aircraft Structures - I | 3 | 1 | 1 | 5 |
| AERO205 | Aircraft Maintenance | 2 | - | - | 2 |
| **Value Addition Courses** | | | | | | |
| BC202 | Professional Communication for Recruitment and Employability | Communication Skills [1] | 1 | - | - | 1 |
| BS202 | Values & Ethics for Personal & Professional Development | Behavioral Science [1] | 1 | - | - | 1 |
| **Choose any one of the following** | | | | | | |
| FREN144 | Communicative French – I | Foreign Business Language [2] | 2 | - | - | 2 |
| GRMN112 | Communicative German – I |
| SPAN112 | Communicative Spanish – I |
| JPAN104 | Communicative Japanese – I |
| CHIN104 | Communicative Chinese – I |
| ARAB104 | Communicative Arabic – I |
| RUSS104 | Communicative Russian – I |
| SANS104 | Communicative Sanskrit – I |
|  |  | Outdoor Activity Based Courses  [0-1] | - | - | - | 0-1 |
| Total number of credits | | | | | | 26 |
| Practical Training - I of 2 credits is to be conducted during summer break after 4th Semester & evaluation in 5th Semester | | | | | | |

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| **Program Structure As Per Prescribed Framework** | | | | | | | | | |
| **Semester V** | | | | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | **Credit Units** |
|  |  |  | | **L** | **T** | | **P/S/FW** | |  |
|  |  | Basic Sciences Courses | |  | |  | |  | 0 |
|  |  | Engineering Sciences Courses [0-2] | |  | |  | |  | 0 |
| AERO303 | Aerodynamics – II | Core Courses [11-17] | | 3 | | 1 | | 2 | 5 |
| AERO304 | Propulsion – II | 3 | | 1 | | 2 | 5 |
| AERO305 | Aircraft Structures – II | 2 | | 1 | | - | 3 |
| AERO301 | Aircraft Materials & Processes | 3 | | 0 | | 0 | 3 |
| ANT202 | Fundamental of Product Design and Development | Specialisation Elective Courses [0-7] | | 1 | | 0 | | 2 | 2 |
|  |  |  | |  | |  |  |
|  |  | **University Electives** |  | |  | | |  |  |
|  |  | 1. Domain Elective Courses | |  | |  | |  | 0-4 |
|  |  | 1. Open Elective Courses | |  | |  | |  | 0-3 |
|  |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  | 0-1 |
| IT310 | Aptitude and Reasoning Ability | Employability and Skill Enhancement Courses | |  | |  | |  | 2 |
|  |  | Industry Specific Courses | |  | |  | |  | 0-6 |
| ETPT100 | In-House Practical Training | Non-Teaching Credit Courses | |  | |  | |  | 2 |
|  |  | Mandatory Courses | |  | |  | |  | 0 |
|  |  | **Humanities and Social Sciences including Management Courses** |  | |  | | |  |  |
|  |  | 1. Value Addition Courses  ➨Behavioural Science – Human | |  | |  | |  | 4 |
|  |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  | 0 |
|  |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  | 2 |
|  |  | Humanities and Management Courses | |  | |  | |  | 0 |
|  |  | SAP Courses | |  | |  | |  | 0-14 |
|  |  | MOOCs | |  | |  | |  | 0-4 |
|  |  | **Total** | |  | |  | |  | **28** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Program Structure As Per Prescribed Framework** | | | | | | | | | |
| **Semester VI** | | | | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | **Credit Units** |
|  |  |  | | **L** | **T** | | **P/S/FW** | |  |
|  |  | Basic Sciences Courses | |  | |  | |  | 0 |
|  |  | Engineering Sciences Courses [0-2] | |  | |  | |  | 0 |
| AERO313 | Aircraft Design | Core Courses [16-19] | | 3 | | 1 | | - | 4 |
| AERO312 | Aircraft Stability & Control | 3 | | 1 | | - | 4 |
| AERO311 | Airplane performance | 3 | | 1 | | - | 4 |
| AERO401 | Aircraft Composite Materials | 3 | | 0 | | 0 | 3 |
| AERO302 | Aircraft Quality Control, Quality Assurance and Certification | 3 | | - | | - | 3 |
| ANT203 | Fundamental of CAT | Specialisation Elective Courses [3-6] | | 0 | | 0 | | 2 | 1 |
| ANT204 | Aircraft systems and Instrumentation | 3 | | 0 | | 0 | 3 |
| ANT301 | Aircraft modelling and simulation | 2 | | 0 | | 2 | 3 |
|  |  | **University Electives** |  | |  | | |  |  |
|  |  | 1. Domain Elective Courses | |  | |  | |  | 0-4 |
|  |  | 1. Open Elective Courses | |  | |  | |  | 0-3 |
|  |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  | 0-1 |
| SKE304 | Aerospace Employability and Career Enhancement (UG) | Employability and Skill Enhancement Courses | |  | |  | |  | 2 |
|  |  | Industry Specific Courses | |  | |  | |  | 0-6 |
|  |  | Non-Teaching Credit Courses | |  | |  | |  | 0 |
|  |  | Mandatory Courses | |  | |  | |  | 0 |
|  |  | **Humanities and Social Sciences including Management Courses** |  | |  | | |  |  |
|  |  | 1. Value Addition Courses  ➨Behavioural Science – Human | |  | |  | |  | 0 |
|  |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  | 4 |
|  |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  | 2 |
|  |  | Humanities and Management Courses | |  | |  | |  | 0 |
|  |  | SAP Courses | |  | |  | |  | 0-13 |
|  |  | MOOCs | |  | |  | |  | 0-4 |
|  |  | **Total** | |  | |  | |  | **30** |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | | |
|  | **Semester VII** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P** | | **SW** |  |
| AERO413 | | Flight Dynamics | Core Courses | | 2 | | 0 | | 2 |  | 3 |
| AERO412 | | Boundary Layer Theory | Specialisation Elective Courses[15-18] | | 3 | | - | | - |  | 3 |
| AERO414 | | Principles of Helicopter Engineering | 3 | |  | | - |  | 3 |
| AERO423 | | Computational Fluid Dynamics | 2 | | 1 | | 2 | 2 | 5 |
| AERO424 | | Introduction to Finite Element Method | 2 | | 1 | | 2 | 2 | 5 |
| AERO404 | | Experimental Aerodynamics | 3 | |  | | - |  | 3 |
| SPAC405 | | Aerospace Power Electronics | 2 | | - | | - |  | 2 |
| SPAC 412 | | Aerospace Software Engineering | 3 | | 0 | | 0 |  | 3 |
| SPAC 407 | | Basics of system simulation & modeling | 3 | | 0 | | 0 |  | 3 |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0-6 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0-3 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0-1 |
|  | |  | Employability and Skill Enhancement Courses | |  | |  | |  |  | 0-4 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0-9 |
| ETII100 | | Industry Internship (UG) | Non-Teaching Credit Courses | |  | |  | |  |  | 2 |
| ETMN100 | | Minor Project (UG) | Mandatory Courses | |  | |  | |  |  | 4 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-10 |
|  | |  | MOOCs | |  | |  | |  |  | 0-4 |
|  | |  | **Total** | |  | |  | |  |  | **20** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | | |
|  | **Semester VIII** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P** | | **SW** |  |
|  | |  | Basic Sciences Courses | |  | |  | |  |  | 0 |
|  | |  | Engineering Sciences Courses | |  | |  | |  |  | 0 |
|  | |  | Core Courses | |  | |  | |  |  | 0 |
| AERO415 | | Introduction to Automatic  Flight Control | Specialization Elective Courses[0-6] | | 3 | | - | | - |  | 3 |
| AERO403 | | Rockets & Missiles | 3 | | - | | - |  | 3 |
| AERO421 | | Aeroelasticity | 3 | | - | | - |  | 3 |
| AERO416 | | Theory of Vibrations | 2 | | 1 | | 2 |  | 4 |
| AERO422 | | Heat Transfer | 3 | | - | | - |  | 3 |
| New Course | | Basics of Machine Learning | 2 | | 0 | |  | 2 | 3 |
| SPAC409 | | Unmanned Aircraft Systems |  | | 3 | | 0 | | 0 |  | 3 |
| SPAC413 | | Elementary Soft Computing |  | | 3 | | 0 | | 0 |  | 3 |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0 |
|  | |  | Employability and Skill Enhancement Courses | |  | |  | |  |  | 0 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0 |
|  | |  | Non-Teaching Credit Courses | |  | |  | |  |  | 10 |
|  | |  | Mandatory Courses | |  | |  | |  |  | 0 |
|  | |  | **Humanities and Social Sciences including Management Courses** |  | |  | | |  |  |  |
|  | |  | 1. Value Addition Courses  ➨Behavioral Science – Human | |  | |  | |  |  | 0 |
|  | |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  |  | 0 |
|  | |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  |  | 0 |
|  | |  | Humanities and Management Courses | |  | |  | |  |  | 0 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-6 |
|  | |  | MOOCs | |  | |  | |  |  | 0-6 |
|  | |  | **Total** | |  | |  | |  |  | **16** |

**Total Credits for the Programme: 208**

**Minimum Credits Prescribed by the University: 208**

|  |  |
| --- | --- |
| **Programme Learning Outcomes:** | |
|  | 1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of aerospace engineering. 2. The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for aerospace engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practice with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change. |

**Annual Outcome Assessment Plan: (as per the University format)**

**Direct Measures**

* Evaluation of End Term Examination
* Continuous Assessment through Class Tests, Assignment, Presentation and Viva
* Summer Project and Summer Internship

**Indirect Measure**

* Feedback from Industry Mentor
* Feedback from placement companies
* Feedback from Human Value Organization about causes undertakes.
* Feedback from Parents
* Feedback from External Examiners

**Assessment Scheme: (as per the University format)**

**Components Codes Weightage (%)**

Case Discussion/ Presentation/ Analysis C 05 - 10

Home Assignment H 05 - 10

Project P 05 - 10

Seminar S 05 - 10

Viva V 05 - 10

Quiz Q 05 - 10

Class Test CT 10 - 15

Attendance A 05

End Semester Examination EE 70

**Employability of Graduands (Specify Industry/ Sector & Level):**

The programme aims to make of students eligible to join various sector of aerospace engineering like DRDO, ADA, ISRO as scientist, Air-Force, Indian Navy and Indian Army as commissioned officers, HAL, NAL, ADE etc as aircraft design engineer, IITs/IISc as research associate, and IT Companies as software engineers. Students may also join IIT’s, IISc and reputed foreign universities for higher studies.

**Resource Planning:**

The institute has highly qualified faculty from IIT’s, scientists from DRDO, ISRO and industry experienced faculty from AIRFORCE. Institute has well equipped library and state of the art Aerodynamics, Structure, Propulsion, Vibration, Simulation and CFD/FEM labs. The curriculum & infrastructure required for the program are upgraded periodically in consultation with leading professionals, academicians and industry expert to meet the industry requirement and benchmarking with national/international universities.

**Name of Relevant Statutory / Accrediting Body/Bodies other than UGC, if any**

* ISO certified programme.
* Accredited by IET, UK.
* Accreditation by ABET is in the process.

**Does Programme meets the norms of Relevant Statutory/Accrediting Bodies, please specify:**

* The programme meets AICTE norms.

**Programme structure of B.Tech ( Aerospace Engineering), Batch:** 2017-2021

**Programme Description:** It is a graduate programme with specialization in aerospace engineering which deals with the design, construction, and study of the science behind the forces and physical properties of aircraft, rockets and flying crafts. The curriculum is developed such that student learns fundamental and advanced subjects of aerospace engineering. The knowledge obtained through this programme enables student to be successful professional in the field of aerospace engineering.

**Programme Educational Objectives/Goals:**

|  |  |
| --- | --- |
| **PEO1** | The students shall have the ability to apply knowledge of mathematics, science, computing and engineering for research, design and development of novel products and solutions as an individual/ member of a team/ leader in diverse teams and as an entrepreneur. |
| **PEO2** | The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. |
| **PEO3** | The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams. |
| **PEO4** | Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. |
| **PEO5** | The student will have the ability to support and practice independent and life-long learning for professional development. |

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| **Programme Structure as per prescribed programme framework** | | | | | | | |
| **Semester I** | | | | | | | |
| **Course Code** | **Course Title** | **Course Type** | **Contact Hrs** | | | | **Credit Units** |
|  |  |  | L | | T | P/S/FW |  |
| ECON132 | Economics for Engineers | Humanities, Social Science & Management Courses [3] | 2 | | 0 | 0 | 2 |
| SOC104 | Sociology for Engineers | 1 | | 0 | 0 | 1 |
| MATH114 | Applied Mathematics - I | Basic Science Courses [9-12] | 3 | | 1 | 0 | 4 |
| PHYS101 | Applied Physics – I | 2 | | 1 | 2 | 4 |
| CHEM101 | Applied Chemistry | 2 | | 1 | 2 | 4 |
| ES103 | Basic Electrical Engineering | Engineering Science Courses  [5-8] | 2 | | 1 | 2 | 4 |
| ES104 | Engineering Graphics Lab | 0 | | 0 | 2 | 1 |
| **Value Addition Courses** | | | | | | | |
| ENG101 | English Language Usage Essentials | Communication skills [1] | 1 | | 0 | 0 | 1 |
| BS101 | Understanding Self for Effectiveness | Behavioral Science [1] | 1 | | 0 | 0 | 1 |
| **Choose any one of the following** | | | | | | | |
| FREN101 | Introduction To Francophone Culture | Foreign Business Language [2] | | 2 | 0 | 0 | 2 |
| GRMN101 | Introduction To German Culture |
| SPAN102 | Introduction To Hispanic World |
| JPAN101 | Introduction To Japanese Culture |
| CHIN101 | Introduction To Chinese Culture |
| ARAB101 | Introduction To Arabic Culture |
| RUSS101 | Introduction To Russian Culture |
| SANS101 | Introduction To Vedic Culture |
|  |  | Outdoor Activity Based Courses [0-1] | | 0 | 0 | 0 | 0-1 |
| Total number of credits | | | | | | | 24 |

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| --- | --- | --- | --- | --- | --- | --- |
| **Semester II** | | | | | | |
| **Course Code** | **Course Title** | **Course Type** | **Contact Hrs** | | | **Credit Units** |
|  |  |  | L | T | P/S/FW |  |
| HIST138 | Aspects of Indian history for engineers | Humanities, Social Science & Management Courses [3] | 1 | 0 | 0 | 1 |
| LAW132 | Law for Engineers | 2 | 0 | 0 | 2 |
| MATH122 | Applied Mathematics – II | Basic Science courses  [9-12] | 3 | 1 | 0 | 4 |
| PHYS113 | Applied Physics - II | 2 | 1 | 2 | 4 |
| EVS101 | Environmental Studies | 4 | 0 | 0 | 4 |
| ES101 | Engineering Mechanics | Engineering Science Courses  [5-8] | 3 | 0 | 2 | 4 |
| ES102 | Elements of Mechanical Engineering Lab | 0 | 0 | 2 | 1 |
| **Value Addition Courses** | | | | | | |
| ENG111 | Introduction to Communication Skills | Communication skills [1] | 1 | 0 | 0 | 1 |
| BS102 | Individual Society & Nation | Behavioral Science [1] | 1 | 0 | 0 | 1 |
| **Choose any one of the following** | | | | | | |
| FREN104 | French Grammar – I | Foreign Business Language [2] | 2 | 0 | 0 | 2 |
| GRMN104 | German Grammar – I |
| SPAN103 | Spanish Grammar – I |
| JPAN102 | Japanese Grammar – I |
| CHIN102 | Chinese Grammar – I |
| ARAB102 | Arabic Grammar – I |
| RUSS102 | Russian Grammar – I |
| SANS102 | Sanskrit Grammar – I |
|  |  | Outdoor Activity Based Courses [0-1] | 0 | 0 | 0 | 0-1 |
| Total number of credits | | | | | | 24 |
| \*Term Paper of 1 credit during summer break after 2nd Semester & evaluation in 3rd Semester | | | | | | |

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| **Program Structure As Per Prescribed Framework** | | | | | | | | | |
| **Semester III** | | | | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | **Credit Units** |
|  |  |  | | **L** | **T** | | **P/S/FW** | |  |
| MATH211 | Applied Mathematics-III | Basic Sciences Courses[4] | | 3 | | 1 | | 0 | 4 |
| ES201 | Basic Electronics Engineering | Engineering Sciences Courses | | 3 | | 0 | | 2 | 4 |
| ES203 | Object Oriented Programming Using C ++ | 3 | | 0 | | 2 | 4 |
| MAE202 | Mechanics of Solids | Core Courses[8-10] | | 2 | | 0 | | 0 | 2 |
| MAE212 | Thermodynamics | 2 | | 0 | | 0 | 2 |
| MAE201 | Mechanics of Fluids | 3 | | 0 | | 0 | 3 |
| AERO201 | Elements of Aerospace Engineering | 2 | | 0 | | 0 | 2 |
| ANT201 | Elements of Aeronautics Lab | 0 | | 0 | | 2 | 1 |
|  |  | Specialisation Elective Courses | |  | |  | |  | 0 |
|  |  | **University Electives** |  | |  | | |  |  |
|  |  | 1. Domain Elective Courses | |  | |  | |  | 0 |
|  |  | 1. Open Elective Courses | |  | |  | |  | 0 |
|  |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  | 0-1 |
|  |  | Employability and Skill Enhancement Courses | |  | |  | |  | 0 |
|  |  | Industry Specific Courses | |  | |  | |  | 0 |
| ETTP100 | Term Paper (UG) | Non-Teaching Credit Courses | |  | |  | |  | 1 |
|  |  | Mandatory Courses | |  | |  | |  | 0 |
|  |  | **Humanities and Social Sciences including Management Courses** |  | |  | | |  |  |
|  |  | 1. Value Addition Courses  ➨Behavioural Science – Human | |  | |  | |  | 0 |
|  |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  | 3 |
|  |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  | 2 |
|  |  | Humanities and Management Courses | |  | |  | |  | 0 |
|  |  | SAP Courses | |  | |  | |  | 0-12 |
|  |  | MOOCs | |  | |  | |  | 0-4 |
|  |  | **Total** | |  | |  | |  | **28** |

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|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | | |
|  | **Semester IV** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | |  | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P/S/FW** | |  |  |
| MATH242 | | Applied Mathematics – IV | Basic Sciences Courses[4] | | 3 | | 1 | | - |  | 4 |
| ES204 | | Basic Simulation Lab | Engineering Sciences Courses[1-3] | | 0 | | 0 | | 2 |  | 1 |
| AERO202 | | Aerodynamics - I | Core Courses[15-17] | | 3 | | 1 | | 2 |  | 5 |
| AERO203 | | Propulsion - I | 3 | | 1 | | 2 |  | 5 |
| AERO204 | | Aircraft Structures - I | 3 | | 1 | | 2 |  | 5 |
| AERO205 | | Aircraft Maintenance | 2 | | 0 | | 0 |  | 2 |
|  | |  | Specialisation Elective Courses | |  | |  | |  |  | 0 |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0-1 |
|  | |  | Employability and Skill Enhancement Courses | |  | |  | |  |  | 0 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0-6 |
|  | |  | Non-Teaching Credit Courses | |  | |  | |  |  | 0 |
|  | |  | Mandatory Courses | |  | |  | |  |  | 0 |
|  | |  | **Humanities and Social Sciences including Management Courses** |  | |  | | |  |  |  |
|  | |  | 1. Value Addition Courses  ➨Behavioural Science – Human | |  | |  | |  |  | 3 |
|  | |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  |  | 0 |
|  | |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  |  | 2 |
|  | |  | Humanities and Management Courses | |  | |  | |  |  | 0 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-14 |
|  | |  | MOOCs | |  | |  | |  |  | 0-4 |
|  | |  | **Total** | |  | |  | |  |  | **27** |
|  |  | | | | | | | | | | |
|  |  | | | | | | | | | | |
|  | **Program Structure As Per Prescribed Framework**  **Semester V** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P** | | **SW** |  |
|  | |  | Basic Sciences Courses | |  | |  | |  |  | 0 |
|  | |  | Engineering Sciences Courses [0-2] | |  | |  | |  |  | 0 |
| AERO303 | | Aerodynamics – II | Core Courses[11-17] | | 2 | | 1 | | 2 | 2 | 5 |
| AERO304 | | Propulsion – II | 2 | | 1 | | 2 | 2 | 5 |
| AERO305 | | Aircraft Structures – II | 2 | | 0 | | 2 |  | 3 |
| ANT202 | | Fundamental of Product Design and Development | Specialisation Elective Courses[0-6] | | 1 | | 0 | | 2 |  | 2 |
| AERO422 | | Heat Transfer | 3 | | 0 | | 0 |  | 3 |
| AERO301 | | Aircraft Materials & Processes | 3 | | 0 | | 0 |  | 3 |
|  | |  |  | |  | |  | |  |  |  |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0-4 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0-3 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0-1 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0-6 |
| IT310 | | Aptitude & Reasoning ability | Employability and Skill Enhancement Courses | |  | |  | |  |  | 2 |
| ETPT100 | | In-House Practical Training (UG) | NTCC | |  | |  | |  |  | 2 |
|  | |  | 1. Value Addition Courses  ➨Behavioural Science – Human | |  | |  | |  |  | 3 |
|  | |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  |  | 0 |
|  | |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  |  | 2 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-13 |
|  | |  | MOOCs | |  | |  | |  |  | 0-4 |
|  | |  | **Total** | |  | |  | |  |  | **27** |

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|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | | |
|  | **Semester VI** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P** | | **SW** |  |
| AERO313 | | Aircraft Design | Core Courses [16-19] | | 3 | | 1 | | 0 |  | 4 |
| AERO312 | | Aircraft Stability & Control | 3 | | 1 | | 0 |  | 4 |
| AERO311 | | Airplane Performance | 2 | | 1 | |  | 2 | 4 |
| AERO302 | | Aircraft Quality Control, Quality Assurance and Certification | 3 | | 0 | | 0 |  | 3 |
| AERO401 | | Aircraft Composite Materials | 3 | | 0 | | 0 |  | 3 |
| ANT203 | | Fundamentals of CAT (Aero) | Specialisation Elective Courses [3-6] | | 0 | | 0 | | 2 |  | 1 |
| AERO315 | | Airplane Systems and Instruments | 3 | | 0 | | 0 |  | 3 |
| SPAC409 | | Unmanned Aircraft Systems | 3 | | 0 | | 0 |  | 3 |
| SPAC413 | | Elementary Soft Computing | 3 | | 0 | | 0 |  | 3 |
| SPAC 323 | | Aerospace Embedded System | 3 | | 0 | | 2 |  | 4 |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0-4 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0-3 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0-1 |
| SKE304 | | Aerospace Employability and Career Enhancement (UG) | Employability and Skill Enhancement Courses | |  | |  | |  |  | 2 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0-6 |
|  | |  | Non-Teaching Credit Courses | |  | |  | |  |  | 0 |
|  | |  | 1. Value Addition Courses  ➨Behavioural Science – Human | |  | |  | |  |  | 0 |
|  | |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  |  | 3 |
|  | |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  |  | 2 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-13 |
|  | |  | MOOCs | |  | |  | |  |  | 0-4 |
|  | |  | **Total** | |  | |  | |  |  | **29** |

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|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | | |
|  | **Semester VII** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P** | | **SW** |  |
| AERO413 | | Flight Dynamics | Specialisation Elective Courses[13-16] | | 2 | | 0 | | 2 |  | 3 |
| AERO412 | | Boundary Layer Theory | 3 | | 0 | | 0 |  | 3 |
| AERO414 | | Principles of Helicopter Engineering | 3 | | 0 | | 0 |  | 3 |
| AERO423 | | Computational Fluid Dynamics | 2 | | 1 | | 2 | 2 | 5 |
| AERO424 | | Introduction to Finite Element Method | 2 | | 1 | | 2 | 2 | 5 |
| AERO402 | | Experimental Aerodynamics | 3 | | 0 | | 0 |  | 3 |
| SPAC405 | | Aerospace Power Electronics | 2 | | 0 | | 0 |  | 2 |
| SPAC 412 | | Aerospace Software Engineering | 3 | | 0 | | 0 |  | 3 |
| SPAC 407 | | Basics of system simulation & modeling | 2 | | 0 | | 0 |  | 2 |
| SPAC319 | | Aerospace System Simulation Techniques | 3 | | 0 | | 0 |  | 3 |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0-6 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0-3 |
|  | |  | 1. **Outdoor Activity Based Courses**  * **HVCO** * **EAC / PMYUVA** * **MTC** * **Sports** | |  | |  | |  |  | **0-2** |
|  | |  | Employability and Skill Enhancement Courses | |  | |  | |  |  | 0-4 |
|  | |  | **Value Addition Courses ➨Professional Ethics** | |  | |  | |  |  | **2** |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0-9 |
| **ETII100** | | **Industry Internship (UG)** | **Non-Teaching Credit Courses** | |  | |  | |  |  | **2** |
| ETMN100 | | Minor Project | Mandatory Courses | |  | |  | |  |  | 4 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-10 |
|  | |  | MOOCs | |  | |  | |  |  | 0-4 |
|  | |  | **Total** | |  | |  | |  |  | **20** |

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|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | | |
|  | **Semester VIII** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | |  | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P/S/FW** | |  |  |
| AERO415 | | Introduction to Automatic  Flight Control | Specialisation Elective Courses[0-6] | | 3 | | 0 | | 0 |  | 3 |
| AERO403 | | Rockets & Missiles | 3 | | 0 | | 0 |  | 3 |
| AERO421 | | Aeroelasticity | 3 | | 0 | | 0 |  | 3 |
| AERO416 | | Theory of Vibrations | 2 | | 1 | | 2 |  | 4 |
| AERO314 | | Basics of Machine Learning | 2 | | 0 | |  | 2 | 3 |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0-2 |
|  | |  | Employability and Skill Enhancement Courses | |  | |  | |  |  | 0 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0 |
| ETMJ100 | | Major Project | Non-Teaching Credit Courses | |  | |  | |  |  | 10 |
|  | |  | Mandatory Courses | |  | |  | |  |  | 0 |
|  | |  | **Humanities and Social Sciences including Management Courses** |  | |  | | |  |  |  |
|  | |  | 1. Value Addition Courses  ➨Behavioural Science – Human | |  | |  | |  |  | 0 |
|  | |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  |  | 0 |
|  | |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  |  | 0 |
|  | |  | Humanities and Management Courses | |  | |  | |  |  | 0 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-6 |
|  | |  | MOOCs | |  | |  | |  |  | 0-6 |
|  | |  | **Total** | |  | |  | |  |  | **16** |

**Total Credits for the Programme: 195+2 CU floating HVCO**

**Minimum Credits Prescribed by the University: 195+2 CU floating HVCO**

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| --- | --- |
| **Programme Learning Outcomes:** | |
|  | 1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of aerospace engineering. 2. The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for aerospace engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practice with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change. |

**Annual Outcome Assessment Plan: (as per the University format)**

**Direct Measures**

* Evaluation of End Term Examination
* Continuous Assessment through Class Tests, Assignment, Presentation and Viva
* Summer Project and Summer Internship

**Indirect Measure**

* Feedback from Industry Mentor
* Feedback from placement companies
* Feedback from Human Value Organization about causes undertakes.
* Feedback from Parents
* Feedback from External Examiners

**Assessment Scheme: (as per the University format)**

**Components Codes Weightage (%)**

Case Discussion/ Presentation/ Analysis C 05 - 10

Home Assignment H 05 - 10

Project P 05 - 10

Seminar S 05 - 10

Viva V 05 - 10

Quiz Q 05 - 10

Class Test CT 10 - 15

Attendance A 05

End Semester Examination EE 70

**Employability of Graduands (Specify Industry/ Sector & Level):**

The programme aims to make of students eligible to join various sector of aerospace engineering like DRDO, ADA, ISRO as scientist, Air-Force, Indian Navy and Indian Army as commissioned officers, HAL, NAL, ADE etc as aircraft design engineer, IITs/IISc as research associate, and IT Companies as software engineers. Students may also join IIT’s, IISc and reputed foreign universities for higher studies.

**Resource Planning:**

The institute has highly qualified faculty from IIT’s, scientists from DRDO, ISRO and industry experienced faculty from AIRFORCE. Institute has well equipped library and state of the art Aerodynamics, Structure, Propulsion, Vibration, Simulation and CFD/FEM labs. The curriculum & infrastructure required for the program are upgraded periodically in consultation with leading professionals, academicians and industry expert to meet the industry requirement and benchmarking with national/international universities.

**Name of Relevant Statutory / Accrediting Body/Bodies other than UGC, if any**

* ISO certified programme.
* Programme is accredited by IET, UK.

**Does Programme meets the norms of Relevant Statutory/Accrediting Bodies, please specify:**

* The programme meets AICTE norms.

**Programme structure of B.Tech ( Aerospace Engineering), Batch:** 2018-2022

**Programme Description:** It is a graduate programme with specialization in aerospace engineering which deals with the design, construction, and study of the science behind the forces and physical properties of aircraft, rockets and flying crafts. The curriculum is developed such that student learns fundamental and advanced subjects of aerospace engineering. The knowledge obtained through this programme enables student to be successful professional in the field of aerospace engineering.

**Programme Educational Objectives/Goals:**

|  |  |
| --- | --- |
| **PEO1** | The students shall have the ability to apply knowledge of mathematics, science, computing and engineering for research, design and development of novel products and solutions as an individual/ member of a team/ leader in diverse teams and as an entrepreneur. |
| **PEO2** | The students shall have the ability to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. |
| **PEO3** | The students will be able to practice professional ethics and academic integrity and demonstrate these as an individual/ team member/ leader in diverse teams. |
| **PEO4** | Students will be able to demonstrate professional attitudes, effective communication and behavioral skills and sustain effective performance in the professional/entrepreneurial careers. |
| **PEO5** | The student will have the ability to support and practice independent and life-long learning for professional development. |

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| **Program Structure As Per Prescribed Framework** | | | | | | | | | |
| **Semester I** | | | | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | **Credit Units** |
|  |  |  | | **L** | **T** | | **P/S/FW** | |  |
| MATH114 | Applied Mathematics - I | Basic Sciences Courses[9-12] | | 3 | | 1 | | 0 | 4 |
| CHEM136 | Engineering Chemistry | 3 | | 1 | | 2 | 5 |
| ES103 | Basic Electrical Engineering | Engineering Sciences Courses[5-8] | | 2 | | 1 | | 2 | 4 |
| EVS104 | Introduction to Environmental studies | 3 | | 0 | | 0 | 3 |
| ES104 | Engineering graphics Lab | 0 | | 0 | | 2 | 1 |
| **University Electives** | | |  | |  | | |  |  |
|  |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | | 0 | | 0 | | 0 | 0-1 |
| **Humanities and Social Sciences including Management Courses** | | |  | |  | | |  |  |
|  |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  | 4 |
|  |  | (2) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  | 2 |
| LAW132 | Law for Engineers | Humanities and  Management Courses | | 2 | | 0 | | 0 | 2 |
| HIST138 | Aspects of Indian history for engineers | 1 | | 0 | | 0 | 1 |
|  |  | **Total** | |  | |  | |  | **26** |

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| **Program Structure As Per Prescribed Framework** | | | | | | | | |
| **Semester II** | | | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | **Contact Hrs** | | | | | **Credit Units** |
|  |  |  | **L** | **T** | | **P/S/FW** | |  |
| MATH122 | Applied Mathematics – II | Basic Sciences Courses[9-12] | 3 | | 1 | | 0 | 4 |
| PHYS132 | Engineering Physics | 3 | | 1 | | 2 | 5 |
| ES202 | Introduction to programming in C | 2 | | 0 | | 2 | 3 |
| ES101 | Engineering Mechanics | Engineering Sciences Courses[5-8] | 3 | | 0 | | 2 | 4 |
| ES102 | Elements of Mechanical Engineering Lab | 0 | | 0 | | 2 | 1 |
|  |  | 1. Open Elective Courses |  | |  | |  | 0-1 |
| Outdoor Activity Based Courses   * HVCO * EAC / PMYUVA * MTC * Sports | | |  | |  | |  | 0-1 |
| Value Addition Courses | | Communication Skills |  | |  | |  | 4 |
| Foreign Business Language |  | |  | |  | 2 |
| SOC104 | Sociology for Engineers |  | 1 | | 0 | | 0 | 1 |
| ECON132 | Economics for Engineers | 2 | | 0 | | 0 | 2 |
|  |  | **Total** |  | |  | |  | **26** |

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| **Program Structure As Per Prescribed Framework** | | | | | | | | | |
| **Semester III** | | | | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | **Credit Units** |
|  |  |  | | **L** | **T** | | **P/S/FW** | |  |
| MATH211 | Applied Mathematics – III | Basic Sciences Courses[4] | | 3 | | 1 | | 0 | 4 |
| ES201 | Basic Electronics Engineering | Engineering Science Courses [8-10] | | 3 | | 0 | | 2 | 4 |
| ES203 | Object Oriented Programming Using C ++ | 3 | | 0 | | 2 | 4 |
| MAE202 | Mechanics of Solids | Core Courses[8-10] | | 2 | | 0 | | 0 | 2 |
| MAE212 | Thermodynamics | 2 | | 0 | | 0 | 2 |
| AERO206 | *Fluid Mechanics* | *2* | | *0* | | *2* | *3* |
| AERO201 | Elements of Aerospace Engineering | 2 | | 0 | | 0 | 2 |
| ANT201 | Elements of Aeronautics Lab | 0 | | 0 | | 2 | 1 |
|  |  | Specialisation Elective Courses | |  | |  | |  | 0 |
|  |  | **University Electives** |  | |  | | |  |  |
|  |  | 1. Domain Elective Courses | |  | |  | |  | 0 |
|  |  | 1. Open Elective Courses | |  | |  | |  | 0 |
|  |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  | 0-1 |
|  |  | Employability and Skill Enhancement Courses | |  | |  | |  | 0 |
|  |  | Industry Specific Courses | |  | |  | |  | 0 |
| ETIN101 | Internship I | Non-Teaching Credit Courses | |  | |  | |  | 1 |
|  |  | Mandatory Courses | |  | |  | |  | 0 |
|  |  | **Humanities and Social Sciences including Management Courses** |  | |  | | |  |  |
|  |  | 1. Value Addition Courses  ➨Behavioural Science – Human | |  | |  | |  | 0 |
|  |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  | 0 |
|  |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  | 2 |
|  |  | Humanities and Management Courses | |  | |  | |  | 0 |
|  |  | SAP Courses | |  | |  | |  | 0-12 |
|  |  | MOOCs | |  | |  | |  | 0-4 |
|  |  | **Total** | |  | |  | |  | **25** |

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|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | | |
|  | **Semester IV** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P** | | **SW** |  |
| MATH242 | | Applied Mathematics – IV | Basic Sciences Courses | | 3 | | 1 | | - |  | 4 |
| ES204 | | Basic Simulation Lab | Engineering Sciences Courses [1-3] | | 0 | | 0 | | 2 |  | 1 |
| AERO202 | | Aerodynamics - I | Core Courses [15-17] | | 2 | | 1 | | 2 | 2 | 5 |
| AERO203 | | Propulsion - I | 2 | | 1 | | 2 | 2 | 5 |
| AERO204 | | Aircraft Structures - I | 3 | | 1 | | 2 |  | 5 |
| AERO205 | | Aircraft Maintenance | 2 | | 0 | | 0 |  | 2 |
|  | |  | Specialisation Elective Courses | |  | |  | |  |  | 0 |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0-1 |
|  | |  | Employability and Skill Enhancement Courses | |  | |  | |  |  | 0 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0-6 |
|  | |  | Non-Teaching Credit Courses | |  | |  | |  |  | 0 |
|  | |  | Mandatory Courses | |  | |  | |  |  | 0 |
|  | |  | **Humanities and Social Sciences including Management Courses** |  | |  | | |  |  |  |
|  | |  | 1. Value Addition Courses  ➨Behavioural Science – Human | |  | |  | |  |  | 4 |
|  | |  | 1. Value Addition Courses  ➨Communication Skills | |  | |  | |  |  | 0 |
|  | |  | (3) Value Addition Courses   ➨Foreign Business Language | |  | |  | |  |  | 2 |
|  | |  | Humanities and Management Courses | |  | |  | |  |  | 0 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-14 |
|  | |  | MOOCs | |  | |  | |  |  | 0-4 |
|  | |  | **Total** | |  | |  | |  |  | **28** |

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|  | **Program Structure As Per Prescribed Framework**  **Semester V** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P** | | **SW** |  |
| AERO303 | | Aerodynamics – II | Core Courses[11-17] | | 2 | | 1 | | 2 | 2 | 5 |
| AERO304 | | Propulsion – II | 2 | | 1 | | 2 | 2 | 5 |
| AERO305 | | Aircraft Structures – II | 2 | | 0 | | 2 |  | 3 |
| ANT202 | | Fundamental of Product Design and Development | Specialisation Elective Courses[0-7] | | 1 | | 0 | | 2 |  | 2 |
| AERO422 | | Heat Transfer | 3 | | 0 | | 0 |  | 3 |
| AERO301 | | Aircraft Materials & Processes | 3 | | 0 | | 0 |  | 3 |
|  | |  |  | |  | |  | |  |  |  |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0-4 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0-3 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0-2 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0-6 |
| SKE301 | | Aptitude & Reasoning ability | Employability and Skill Enhancement Courses | |  | |  | |  |  | 2 |
| ETPT100 | | In-House Practical Training (UG) | NTCC | |  | |  | |  |  | 2 |
|  | | Value Addition Courses | Behavioural Science – Human | |  | |  | |  |  | 4 |
|  | | Foreign Business Language | |  | |  | |  |  | 2 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-14 |
|  | |  | MOOCs | |  | |  | |  |  | 0-4 |
|  | |  | **Total** | |  | |  | |  |  | **28** |

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|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | |
|  | **Semester VI** | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | **L** | **T** | | **P** | | **SW** |  |
| AERO313 | | Aircraft Design | Core Courses [16-19] | 3 | | 1 | | 0 |  | 4 |
| AERO312 | | Aircraft Stability & Control | 3 | | 1 | | 0 |  | 4 |
| AERO311 | | Airplane Performance | 2 | | 1 | |  | 2 | 4 |
| AERO302 | | Aircraft Quality Control, Quality Assurance and Certification | 3 | | 0 | | 0 |  | 3 |
| AERO401 | | Aircraft Composite Materials | 3 | | 0 | | 0 |  | 3 |
| ANT203 | | Fundamentals of CAT (Aero) | Specialisation Elective Courses [3-6] | 0 | | 0 | | 2 |  | 1 |
| AERO315 | | Airplane Systems and Instruments | 3 | | 0 | | 0 |  | 3 |
| SPAC409 | | Unmanned Aircraft Systems | 3 | | 0 | | 0 |  | 3 |
| SPAC413 | | Elementary Soft Computing | 3 | | 0 | | 0 |  | 3 |
| SPAC 323 | | Aerospace Embedded System | 3 | | 0 | | 2 |  | 4 |
|  | |  | Domain Elective Courses |  | |  | |  |  | 0-4 |
|  | |  | Open Elective Courses |  | |  | |  |  | 0-3 |
|  | |  | Outdoor Activity Based Courses |  | |  | |  |  | 0-2 |
| SKE304 | | Aerospace Employability and Career Enhancement (UG) | Employability and Skill Enhancement Courses |  | |  | |  |  | 2 |
|  | |  | Industry Specific Courses |  | |  | |  |  | 0-6 |
|  | |  | Non-Teaching Credit Courses |  | |  | |  |  | 0 |
|  | | Value Addition Courses | Foreign Business Language |  | |  | |  |  | 2 |
|  | |  | SAP Courses |  | |  | |  |  | 0-13 |
|  | |  | MOOCs |  | |  | |  |  | 0-4 |
|  | |  | **Total** |  | |  | |  |  | **26** |

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|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | | |
|  | **Semester VII** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P** | | **SW** |  |
| AERO413 | | Flight Dynamics | Specialisation Elective Courses[13-16] | | 2 | | 0 | | 2 |  | 3 |
| AERO412 | | Boundary Layer Theory | 3 | | 0 | | 0 |  | 3 |
| AERO414 | | Principles of Helicopter Engineering | 3 | | 0 | | 0 |  | 3 |
| AERO423 | | Computational Fluid Dynamics | 2 | | 1 | | 2 | 2 | 5 |
| AERO424 | | Introduction to Finite Element Method | 2 | | 1 | | 2 | 2 | 5 |
| AERO402 | | Experimental Aerodynamics | 3 | | 0 | | 0 |  | 3 |
| SPAC405 | | Aerospace Power Electronics | 2 | | 0 | | 0 |  | 2 |
| SPAC 412 | | Aerospace Software Engineering | 3 | | 0 | | 0 |  | 3 |
| SPAC 407 (to be removed) | | Basics of system simulation & modeling | 2 | | 0 | | 0 |  | 2 |
| SPAC 319 | | Aerospace System Simulation Techniques | 3 | | 0 | | 0 |  | 3 |
|  | |  | **University Electives** |  | |  | | |  |  |  |
|  | |  | 1. Domain Elective Courses | |  | |  | |  |  | 0-6 |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0-3 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0-2 |
|  | |  | Employability and Skill Enhancement Courses | |  | |  | |  |  | 0-4 |
|  | |  | Value Addition Courses **➨**Professional Ethics | |  | |  | |  |  | 2 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0-9 |
| ETII100 | | Industry Internship (UG) | Non-Teaching Credit Courses | |  | |  | |  |  | 2 |
| ETMN100 | | Minor Project | Mandatory Courses | |  | |  | |  |  | 4 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-10 |
|  | |  | MOOCs | |  | |  | |  |  | 0-4 |
|  | |  | **Total** | |  | |  | |  |  | **20** |

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|  | **Program Structure As Per Prescribed Framework** | | | | | | | | | |
|  | **Semester VIII** | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | **Contact Hrs** | | | | |  | **Credit Units** |
|  | |  |  | **L** | **T** | | **P/S/FW** | |  |  |
| AERO415 | | Introduction to Automatic  Flight Control | Specialisation Elective Courses[0-6] | 3 | | 0 | | 0 |  | 3 |
| AERO403 | | Rockets & Missiles | 3 | | 0 | | 0 |  | 3 |
| AERO421 | | Aeroelasticity | 3 | | 0 | | 0 |  | 3 |
| AERO416 | | Theory of Vibrations | 2 | | 1 | | 2 |  | 4 |
| AERO314 | | Basics of Machine Learning | 2 | | 0 | |  | 2 | 3 |
|  | |  | Outdoor Activity Based Courses  HVCO, EAC / PMYUVA, MTC, Sports |  | |  | |  |  | 0-2 |
| ETMJ100 | | Major Project | Non-Teaching Credit Courses |  | |  | |  |  | 10 |
|  | |  | SAP Courses |  | |  | |  |  | 0-6 |
|  | |  | MOOCs |  | |  | |  |  | 0-6 |
|  | |  | **Total** |  | |  | |  |  | **16** |

**Total Credits for the Programme: 195 + 2 CU floating HVCO**

**Minimum Credits Prescribed by the University: 195 + 2 CU floating HVCO**

|  |  |
| --- | --- |
| **Programme Learning Outcomes:** | |
|  | 1. The student will apply knowledge of mathematics, sciences and engineering to solve problems using concepts of aerospace engineering. 2. The student will identify, formulate research literature and analyze computer science & engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. The student will create solutions for aerospace engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions 5. The student will create, select and apply appropriate techniques, resources and modern engineering and IT tools, necessary for computing practice with an understanding of the limitations. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge if and need for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or leader of team assembled to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater to both technical and non-technical audiences. 11. The student will demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team as well as to manage projects in multidisciplinary environments. 12. The student will recognise the need for, and will engage in independent and life-long learning in the broadest context of technological change. |

**Annual Outcome Assessment Plan: (as per the University format)**

**Direct Measures**

* Evaluation of End Term Examination
* Continuous Assessment through Class Tests, Assignment, Presentation and Viva
* Summer Project and Summer Internship

**Indirect Measure**

* Feedback from Industry Mentor
* Feedback from placement companies
* Feedback from Human Value Organization about causes undertakes.
* Feedback from Parents
* Feedback from External Examiners

**Assessment Scheme: (as per the University format)**

**Components Codes Weightage (%)**

Case Discussion/ Presentation/ Analysis C 05 - 10

Home Assignment H 05 - 10

Project P 05 - 10

Seminar S 05 - 10

Viva V 05 - 10

Quiz Q 05 - 10

Class Test CT 10 - 15

Attendance A 05

End Semester Examination EE 70

**Employability of Graduands (Specify Industry/ Sector & Level):**

The programme aims to make of students eligible to join various sector of aerospace engineering like DRDO, ADA, ISRO as scientist, Air-Force, Indian Navy and Indian Army as commissioned officers, HAL, NAL, ADE etc as aircraft design engineer, IITs/IISc as research associate, and IT Companies as software engineers. Students may also join IIT’s, IISc and reputed foreign universities for higher studies.

**Resource Planning:**

The institute has highly qualified faculty from IIT’s, scientists from DRDO, ISRO and industry experienced faculty from AIRFORCE. Institute has well equipped library and state of the art Aerodynamics, Structure, Propulsion, Vibration, Simulation and CFD/FEM labs. The curriculum & infrastructure required for the program are upgraded periodically in consultation with leading professionals, academicians and industry expert to meet the industry requirement and benchmarking with national/international universities.

**Name of Relevant Statutory / Accrediting Body/Bodies other than UGC, if any**

* ISO certified programme.
* Programme is accredited by IET, UK.

**Does Programme meets the norms of Relevant Statutory/Accrediting Bodies, please specify:**

* The programme meets AICTE norms.

**Programme structure of B.Tech ( Aerospace Engineering), Batch:** 2019-2023

**Programme Mission:**

The mission of the B.Tech (Aerospace Engineerng) Programme is to provide quality education with the best possible educational facilities to the students for the careers in Aerospace Engineering by continuously updating the programme structure and curriculum as per the current requirement of industry, government, academia and research.

**Programme Description:** Bachelor of Technology in Aerospace Engineering is a four year undergraduate programme which deals with the design, development and study of the science behind the forces and physical properties of flight vehicles, like aircraft, rockets etc. The foundation level courses are Fluid Mechanics, Engineering Mechanics, Mechanics of solids, Thermodynamics and programming in C & C++. These courses lead to a set of applied courses in Flight Mechanics, Aerodynamics, Aircraft Structures, Aerospace Propulsion, Automatic Flight Control, Computational Fluid Dynamics and Finite Element Method. These in turn lead to a set of specialization elective courses which deepens as well as widen the knowledge base. In addition to the above courses in Aerospace Engineering, courses in Basic Science, Electrical & Electronics Engineering, Economics, Management and Humanities help round off the education of Aerospace Engineering B.Tech graduate. Graduates of the B.Tech. programme in Aeropsace Engineering are equipped to undertake challenging work in the design industry, defense, airlines, manufacturing industry, academics, software industry, defense and research organizations. The students who complete the B.Tech Programme in Aerospace Engineering would have acquired the essential knowledge and skill sets to carry out various tasks in different sectors of aerospace field.

**Programme Educational Objectives/Goals:**

|  |  |
| --- | --- |
| **PEO1** | The students shall have the ability to apply knowledge of basic science, latest soft computing and engineering for research, design and development of novel products and solving complex problem as an individual/ member of a team/ leader in multi-functional teams and as an entrepreneur. |
| **PEO2** | The students shall have the ability of creating new value through innovation and to examine the impact of engineering solutions in societal, health, safety, legal, cultural and environmental contexts. |
| **PEO3** | The students will be able to practice and demonstrate professional ethics, academic integrity and will be able to support and practice independent and life-long learning for professional development. |
| **PEO4** | Students will be able to demonstrate professional attitudes, effective communication & behavioral skills, critical thinking, creativity and sustain effective performance in the professional/entrepreneurial careers. |
| **PEO5** | The student will be able to undertake challenging work in the design industry, armed forces, airlines, manufacturing industry, academics, software industry, defence and research organizations. |

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|  | **Program Structure As Per Approved Model Framework** | | | | | | | |
|  | **Semester I** | | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | **Credit Units** |
|  |  |  | | **L** | **T** | **P** | **SW** |  |
| BC105 | Techinical Communication - I | Human Social Sciences &  Management Courses [4] | | 3 | - | **-** | 2 | 4 |
| MATH114 | Applied Mathematics - I | Basic Sciences Courses[9-12] | | 3 | 1 | 0 |  | 4 |
| CHEM136 | Engineering Chemistry | 3 | 1 | 2 |  | 5 |
| ES103 | Basic Electrical Engineering | Engineering Sciences Courses[5-8] | | 2 | 1 | 2 |  | 4 |
| EVS104 | Introduction to Environmental studies | 3 | 0 | 0 |  | 3 |
| ES104 | Engineering graphics Lab | 0 | 0 | 2 |  | 1 |
| **University Electives** | | |  | |  |  |  |  |
|  |  | 1. Outdoor Activity Based   Courses   * HVCO * EAC / PMYUVA * MTC * Sports | | 0 | 0 | 0 |  | 0-1 |
|  |  | Value Addition Courses   ➨Foreign Business Language | |  |  |  |  | 2 |
|  |  | **Total** | |  |  |  |  | **23** |

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|  | **Program Structure As Per Approved Model Framework** | | | | | | |
|  | **Semester II** | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | **Contact Hrs** | | | | **Credit Units** |
|  |  |  | **L** | **T** | **P/S** | **SW** |  |
| MATH122 | Applied Mathematics – II | Basic Sciences Courses[9-12] | 3 | 1 | 0 |  | 4 |
| PHYS132 | Engineering Physics | 3 | 1 | 2 |  | 5 |
| ES202 | Introduction to programming in C | 2 | 0 | 2 |  | 3 |
| ES101 | Engineering Mechanics | Engineering Sciences Courses[5-8] | 3 | 0 | 2 |  | 4 |
| ES102 | Elements of Mechanical Engineering Lab | 0 | 0 | 2 |  | 1 |
|  |  | **University Electives** |  |  |  |  |  |
|  |  | 1. Open Elective Courses |  |  |  |  | 0-1 |
|  |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports |  |  |  |  | 0-1 |
| BC106 | Techinical Communication - II | Value Added course ➨Communication Skills | 3 | - | - | 2 | 4 |
|  |  | Value Added course  ➨Foreign Business Language |  |  |  |  | 2 |
|  |  | **Total** |  |  |  |  | **23** |

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| **Program Structure As Per Approved Model Framework** | | | | | | | | | |
| **Semester III** | | | | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | **Credit Units** |
|  |  |  | | **L** | **T** | | **P/S/FW** | |  |
| MATH211 | Applied Mathematics – III | Basic Sciences Courses  [4] | | 3 | | 1 | | 0 | 4 |
| ES201 | Basic Electronics Engineering | Engineering Science Courses[ 8-10] | | 3 | | 0 | | 2 | 4 |
| ES203 | Object Oriented Programming Using  C++ | 3 | | 0 | | 2 | 4 |
| MAE202 | Mechanics of Solids | Core Courses[8-10] | | 2 | | 0 | | 0 | 2 |
| MAE212 | Thermodynamics | 2 | | 0 | | 0 | 2 |
| AERO206 | Fluid Mechanics | 2 | | 0 | | 2 | 3 |
| AERO201 | Elements of Aerospace Engineering | 2 | | 0 | | 0 | 2 |
| ANT201 | Elements of Aeronautics Lab | 0 | | 0 | | 2 | 1 |
|  |  | **University Electives** |  | |  | | |  |  |
|  |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  | 0-1 |
| ETIN101 | Internship I | Non-Teaching Credit Courses | |  | |  | |  | 1 |
|  |  | Value Addition Courses   ➨Foreign Business Language | |  | |  | |  | 2 |
|  |  | SAP Courses | |  | |  | |  | 0-12 |
|  |  | MOOCs | |  | |  | |  | 0-4 |
|  |  | **Total** | |  | |  | |  | **25** |

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|  | **Program Structure As Per Approved Model Framework** | | | | | | |
|  | **Semester IV** | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | **Contact Hrs** | | | | **Credit Units** |
|  |  |  | **L** | **T** | **P** | **SW** |  |
| BS206 | Understanding Self to enhance Personal Competence | Human Social Sciences & Management Courses [4] |  |  |  |  | 4 |
| MATH242 | Applied Mathematics – IV | Basic Sciences Courses [4] | 3 | 1 | - | - | 4 |
| ES204 | Basic Simulation Lab | Engineering Sciences Courses [1-3] | 0 | 0 | 2 |  | 1 |
| AERO202 | Aerodynamics - I | Core Courses [13-15] | 2 | 1 | 2 | 2 | 5 |
| AERO203 | Propulsion - I | 2 | 1 | 2 | 2 | 5 |
| AERO204 | Aircraft Structures - I | 3 | 1 | 2 | - | 5 |
|  |  | **University Electives** |  |  |  |  |  |
|  |  | Outdoor Activity Based Courses   * HVCO * EAC / PMYUVA * MTC * Sports |  |  |  |  | 0-1 |
|  |  | Industry Specific Courses |  |  |  |  | 0-7 |
|  |  | Value Addition Courses   ➨Foreign Business Language |  |  |  |  | 2 |
|  |  | SAP Courses |  |  |  |  | 0-13 |
|  |  | MOOCs |  |  |  |  | 0-4 |
|  |  | **Total** |  |  |  |  | **26** |

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|  | **Program Structure As Per Approved Model Framework** | | | | | | |
|  | **Semester V** | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | **Contact Hrs** | | | | **Credit Units** |
|  |  |  | **L** | **T** | **P** | **SW** |  |
| AERO303 | Aerodynamics – II | Core Courses[11-15] | 2 | 1 | 2 | 2 | 5 |
| AERO304 | Propulsion – II | 2 | 1 | 2 | 2 | 5 |
| AERO305 | Aircraft Structures – II | 2 | 0 | 2 | - | 3 |
| ANT202 | Fundamental of Product Design and Development | Specialisation Elective Courses  [0-7] | 1 | 0 | 2 |  | 2 |
| AERO422 | Heat Transfer | 3 | 0 | 0 |  | 3 |
| AERO301 | Aircraft Materials & Processes | 3 | 0 | 0 |  | 3 |
| New course | Airplane Systems and Instruments | 3 | 0 | 0 |  | 3 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | Domain Elective Courses |  |  |  |  | 0-4 |
|  |  | **University Electives** |  |  |  |  |  |
|  |  | 1. Open Elective Courses |  |  |  |  | 0-3 |
|  |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports |  |  |  |  | 0-1 |
| SKE301 | Aptitude & Reasoning ability | Employability and Skill Enhancement Courses | - | 1 | - | 2 | 2 |
|  |  | Industry Specific Courses  [0-7] |  |  |  |  | 0-7 |
| ETIN102 | Internship II (IT-2) | Non-Teaching Credit Courses |  |  |  |  | 2 |
| BS307 | Working in Teams for Professional Excellence | 1. Value Addition Courses  ➨Behavioural Science – Human | 3 | - | - | 2 | 4 |
|  |  | (2) Value Addition Courses   ➨Foreign Business Language |  |  |  |  | 2 |
|  |  | SAP Courses |  |  |  |  | 0-14 |
|  |  | MOOCs |  |  |  |  | 0-4 |
|  |  | **Total** |  |  |  |  | **26** |

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|  | **Program Structure As Per Approved Model Framework** | | | | | | |
|  | **Semester VI** | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | **Contact Hrs** | | | | **Credit Units** |
|  |  |  | **L** | **T** | **P** | **SW** |  |
| AERO313 | Aircraft Design | Core Courses[12-15] | 3 | 1 | 0 | - | 4 |
| AERO312 | Aircraft Stability & Control | 3 | 1 | 0 | - | 4 |
| AERO311 | Airplane Performance | 2 | 1 | 0 | 2 | 4 |
| AERO401 | Aircraft Composite Materials | 3 | 0 | 0 |  | 3 |
| ANT203 | Fundamentals of CAT (Aero) | Specialisation Elective Courses[3-7] | 0 | 0 | 2 |  | 1 |
| AERO302 | Aircraft Quality Control, Quality Assurance and Certification | 3 | 0 | 0 |  | 3 |
| AERO416 | Theory of Vibrations | 2 | 1 | 1 |  | 4 |
| New Course | Basics of Machine Learning | 2 | 0 | 2 |  | 3 |
| SPAC409 | Unmanned Aircraft Systems | 3 | 0 | 0 |  | 3 |
| SPAC413 | Elementary Soft Computing | 3 | 0 | 0 |  | 3 |
| SPAC 323 | Aerospace Embeded System | 3 | 0 | 2 |  | 4 |
| AERO205 | Aircraft Maintenance | 2 | 0 | 0 |  | 2 |
|  |  | Domain Elective Courses |  |  |  |  | 0-4 |
|  |  | **University Electives** |  |  |  |  |  |
|  |  | 1. Open Elective Courses |  |  |  |  | 0-3 |
|  |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports |  |  |  |  | 0-1 |
| SKE304 | Aerospace Employability and Career Enhancement | Employability and Skill Enhancement Courses | 1 | - | - | 2 | 2 |
|  |  | Industry Specific Courses |  |  |  |  | 0-7 |
|  |  | Value Addition Courses   ➨Foreign Business Language |  |  |  |  | 2 |
|  |  | SAP Courses |  |  |  |  | 0-12 |
|  |  | MOOCs |  |  |  |  | 0-4 |
|  |  | **Total** |  |  |  |  | **24** |

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|  | **Program Structure As Per Approved Model Framework** | | | | | | | | | | |
|  | **Semester VII** | | | | | | | | | | |
| **Course Code** | | **Course Title** | **Courses Type** | | **Contact Hrs** | | | | | | **Credit Units** |
|  | |  |  | | **L** | **T** | | **P** | | **SW** |  |
| AERO413 | | Flight Dynamics | Core Courses[0-3] | | 2 | 0 | | 2 | | - | 3 |
| AERO412 | | Boundary Layer Theory | Specialisation Elective Courses[10-15] | | 3 | | 0 | | 0 | - | 3 |
| AERO414 | | Principles of Helicopter Engineering | 3 | | 0 | | 0 | - | 3 |
| AERO423 | | Computational Fluid Dynamics | 2 | | 1 | | 2 | 2 | 5 |
| AERO424 | | Introduction to Finite Element Method | 2 | | 1 | | 2 | 2 | 5 |
| AERO402 | | Experimental Aerodynamics | 3 | | 0 | | 0 |  | 3 |
| SPAC405 | | Aerospace Power Electronics | 2 | | 0 | | 0 |  | 2 |
| AERO403 | | Rockets & Missiles | 3 | | 0 | | 0 |  | 3 |
| AERO415 | | Introduction to Automatic Flight Control | 3 | | 0 | | 0 |  | 3 |
| AERO 421 | | Aeroelasticity | 3 | | 0 | | 0 |  | 3 |
| SPAC 412 | | Aerospace Software Engineering | 3 | | 0 | | 0 |  | 3 |
| SPAC 407 | | Basics of system simulation & modeling | 3 | | 0 | | 0 |  | 3 |
|  | |  | Domain Elective Courses |  | |  | | |  |  | 0-6 |
|  | |  | **University Electives** | |  | |  | |  |  |  |
|  | |  | 1. Open Elective Courses | |  | |  | |  |  | 0-3 |
|  | |  | 1. Outdoor Activity Based Courses  * HVCO * EAC / PMYUVA * MTC * Sports | |  | |  | |  |  | 0-1 |
|  | |  | Employability and Skill Enhancement Courses | |  | |  | |  |  | 0-4 |
|  | |  | Industry Specific Courses | |  | |  | |  |  | 0-9 |
| ETIN103 | | Internship-III | Non-Teaching Credit Courses | |  | |  | |  |  | 2 |
| EIMN100 | | Minor Project | Mandatory Courses | |  | |  | |  |  | 4 |
| LAW132 | | Law for Engineers | Human Social Sciences & Management Courses  [6] | | 2 | | 0 | | 0 |  | 2 |
| HIST138 | | Aspects of Indian history for engineers | 1 | | 0 | | 0 |  | 1 |
| SOC104 | | Sociology for  Engineers | 1 | | 0 | | 0 |  | 1 |
| ECON132 | | Economics for Engineers | 2 | | 0 | | 0 |  | 2 |
|  | |  | Value Addition Courses   ➨Foreign Business Language | |  | |  | |  |  | 2 |
|  | |  | SAP Courses | |  | |  | |  |  | 0-13 |
|  | |  | MOOCs | |  | |  | |  |  | 0-4 |
|  | |  | **Total** | |  | |  | |  |  | **26** |

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| **Program Structure As Per Approved Model Framework** | | | | | | | | |
| **Semester VIII** | | | | | | | | |
| **Course Code** | **Course Title** | **Courses Type** | **Contact Hrs** | | | | | **Credit Units** |
|  |  |  | **L** | **T** | | **P/S/FW** | |  |
| ETMJ100 | Major Project | Non-Teaching Credit Courses |  | |  | |  | 10 |
|  |  | **Total** |  | |  | |  | **10** |

**Total Credits for the Programme: 183**

**Minimum Credits Prescribed by the University: 183**

|  |  |
| --- | --- |
| **Programme Learning Outcomes:** | |
|  | 1. The student will apply knowledge of mathematics, science, latest soft computing and engineering to solve complex problems of aerospace engineering. 2. The student will identify and solve research/industry problems using latest soft computing techniques, skills and tools. 3. The student will create solutions for aerospace engineering problems and design system components or processes to meet the current and emerging industrial needs with appropriate consideration for the public health and safety, cultural, societal, and environmental considerations. 4. The student will carry out investigations of problems using research-based knowledge, research methods and new technologies including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions. 5. The student will create, select and apply latest techniques, resources and modern engineering and IT tools necessary for aerospace engineering practices. 6. The student will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practice. 7. The student will recognize the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge for the sustainable development. 8. The student will apply ethical principles and practice professional ethics and responsibilities and norms of the engineering practice. 9. The student will demonstrate effectiveness as an individual and as a member or team leader to undertake a common goal in multidisciplinary settings. 10. The student will use effective communication to cater both technical and non-technical audiences. 11. The student will demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team as well as to manage projects in multidisciplinary environments. 12. The student will recognize the need for, and will engage in independent and life-long learning in the broadest context of technological change. |

**Annual Outcome Assessment Plan: (as per the University format)**

**Direct Measures**

* Evaluation of End Term Examination
* Continuous Assessment through Class Tests, Assignment, Presentation and Viva
* Summer Project and Summer Internship

**Indirect Measure**

* Feedback from Industry Mentor
* Feedback from placement companies
* Feedback from Human Value Organization about causes undertakes.
* Feedback from Parents
* Feedback from External Examiners

**Assessment Scheme: (as per the University format)**

**Components Codes Weightage (%)**

Case Discussion/ Presentation/ Analysis C 05 - 10

Home Assignment H 05 - 10

Project P 05 - 10

Seminar S 05 - 10

Viva V 05 - 10

Quiz Q 05 - 10

Class Test CT 10 - 15

Attendance A 05

End Semester Examination EE 70

**Employability of Graduands (Specify Industry/ Sector & Level):**

The programme aims to make students eligible to join various sectors of aerospace engineering like research organizations as scientist, defence as commissioned officers, manufacturing industry as aircraft design engineer/manager, academic institutions as research associate, and IT Companies as software engineers. Students may also join IIT’s, IISc and reputed foreign universities for higher studies.

**Resource Planning:**

The institute has highly qualified faculty from IIT’s, scientists from DRDO, ISRO and industry experienced faculty from AIRFORCE. Institute has well equipped library and state of the art Aerodynamics, Structure, Propulsion, Vibration, Simulation and CFD/FEM labs. Many new equipment in structure & propulsion lab have been added recently. The curriculum & infrastructure required for the program are upgraded periodically in consultation with leading professionals, academicians and industry expert to meet the industry requirement and benchmarking with national/international universities. High speed subsonic wind tunnel with all the measuring equipment will be installed in the month of July 2019. Placement co-ordinator, lab supervisor/in-charge and one faculty member are likely to be recruited.

**Name of Relevant Statutory / Accrediting Body/Bodies other than UGC, if any**

* ISO certified programme.
* Programme is accredited by IET, UK.

**Does Programme meets the norms of Relevant Statutory/Accrediting Bodies, please specify:**

* The programme meets AICTE norms.

**B1.** List of All programmes:

* + - * B.Tech. ( Aerospace Engineering)
      * B.Tech+M.Tech. ( Aerospace Engineering)-Intg
      * M.Tech. ( Aerospace Engineering)
      * Ph. D. ( Aerospace Engineering)
      * Ph. D. ( Aerospace Engineering)-PT